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NEW YORK BOTANICAL GARDEN
DEC 15 2[illegible]
WITHDRAWN

TESSARIA ABSINTHIOIDES DC.

Branches and leaves appressed, hoary-silky. *Leaves* lanceolate, acuminate both ways, entire or sometimes with coarse, sharp teeth, here and there incised ; underneath nervose-reticulate. *Involucre-scales* glabrous, acute. *Disk* 7–8-flowered.

(Chili, by rivers) ; N. Patagon., rare at Carmen de Patagones on Rio Negro.

24. PSILOCARPHUS Nutt.

Small, tomentose, annual herbs, with alternate, entire *leaves*. *Heads* small, subglobose, terminal or axillary ; disciform, heterogamous, the disk-flowers sterile. *Pappus* none. *Achenes* oblong, not ribbed.

Species 3, California to Patagon.

P. GLOBULIFERUS (Bert. sub. *Micropus*) Speg.

Snowy-tomentose. Stems branching from the base, diffuse. *Leaves* oblong-linear, the floral broader, obtuse. *Heads* terminal and lateral. *Involucral* scales plane, unarmed, obtuse. *Chaff* on receptacle ovate, compressed, tomentose about the achenes, making a hoary globe.

S. Patagon., by Rio Sta. Cruz.

25. MICROPSIS DC.

Small, woolly annuals, with alternate, entire *leaves* and small heads in *glomerules* at the ends of the branches or crowded in the axils. *Heads* disciform, heterogamous. *Involucre* shorter than the receptacular chaff, with few, woolly, hyaline scales. Receptacle cylindraceous, chaffy. *Corollas* filiform in the margin, tubular inwards. *Anthers* subcaudate ; style-branches obtuse. *Pappus* none, or fugacious. *Achenes* small.

Species 5, Eurasia and N. Amer. and the following :

M. NANA DC.

Stems numerous, not 3 cm. long. *Leaves* obovate, obtusely mucronate, appressed-villous, crowded upwards, or as if whorled in the axils.

(Chili) ; N. Patagon., on grassy turf by Rio Negro.

26. CHEVREULIA Cass.

Dwarf, cespitose or slender herbs, with opposite or rosulate, entire *leaves*, hoary underneath at least ; and mediocre or small, disciform, heteroga-

mous *heads*, some sessile, others peduncled. *Involucre-scales* few-seriate, imbricate, scarious, shorter outwards. *Repectacle* naked. *Anthers* basi-sagittate, with slender tails. *Styles* in disk, with slender, truncate branches. *Pappus* finely setose, briefly connate at base. *Achenes* ending in a long rostrum.

Species 7, S. Amer.

1. CHEVREULIA LYCOPODIOIDES DC.

Leaves linear-oblong, obtuse, 4 mm. long. *Heads* terminal, solitary, oblong. *Involucral* scales lanceolate, acuminate, hairy at the base.

Falklands, in dry grassy places; Fuegia.

2. C. STOLONIFERA Cass.

Stem branching, short, stoloniferous. *Leaves* subradical, linear-oblong or obovate, obtuse, entire, mucronate, appressed-hairy. *Scape* longer than the leaves. *Involucral* scales obtuse.

(Chili, at Valdivia; also in Tristan d'Acunha I.); N. Patagon., by Rio Negro.

(Fig. in Eng. & Prantl, iv, 5, p. 184, G, H.)

27. ANTENNARIA Gaertn.

Woolly, perennial herbs, with alternate and basal *leaves*, and small discoid, diœcious or polygamous *heads*, usually capitate or corymbose. *Involucral* scales scarious, imbricated, the outer shorter. *Receptacle* not chaffy. *Staminal* flowers, with scanty pappus of clavate setæ; fertile flowers, with copious, capillary bristles. *Achenes* oblong.

Species 15, mostly in mountains of Eurasia, Australia and extratrop. N. and S. Amer.

(Fig. in Eng. & Prantl, iv, 5, p. 184, C–E.)

A. MAGELLANICA Sch. Bip.

From subligneous root. *Plant* arachnoid, woolly. *Leaves* in radical tufts and cauline; ovate-spatulate, subacute, entire; narrower upwards. *Glomerules* with golden-woolly scales, the inner thin, rounded, glabrous, shorter than the pappus.

Magellan, specimen in Gray Herb., by R. O. Cunningham; S. Patagon., by Hatcher at Rio Coy, "variable, low, 30–60 cm. high"; N. and E. Fuegia, by Dusén, "a rather rare steppe plant."

28. FACELIS Cass.

Annual herbs, branching from the ground, with *leaves* alternate, narrow, entire, emarginate, hoary underneath. *Heads* rather small, axillary or apically aggregated; disciform and heterogamous; the females in the ray, and few fertile, tubular, hermaphrodite in the disk. *Involucre* ovoid, its scales several-seriate, the inner long-scarious; outer woolly; outermost leafy. *Receptacle* naked. *Anthers* basisagittate and tailed. *Style-branches* truncate. Pappus-setæ 1-seriate, plumose, basiconnate as a ring. *Achenes* oblong, beakless.

Species 3, Andine.

F. APICULATA Cass.

Leaves linear, apically truncate or emarginate, the nerve apiculately produced. *Heads* crowded.

(Fig. in Eng. & Prantl, iv, 5, p. 184, J. K.)

(S. Brazil; Argent.); N. Patagon., by Rio Negro.

F. BRACHYCHÆTA (*brachyantha?*).

S. Patagon., high up by Rio Sta. Cruz.

29. ACHYROCLINE Less.

Erect undershrubs, mostly woolly, with panicled *cymes* of small, narrow, few-flowered, yellow to whitish, disciform *heads;* 3–6 filiform, female flowers in the ray, and 1–2 tubular, hermaphrodite flowers in the disk; all fertile. *Receptacle* naked or with few pales. *Anther-tails* small. Style-branches truncate. *Pappus-setæ* scabrous, falling singly.

Specimens 16, Mexico to Brazil, etc., also in Africa and Madagascar.

A. SATUREIOIDES (Lam.) DC.

Branches woolly. *Leaves* sessile, linear, spreading, scarcely acute; the cauline crowded, those on the branches distant, webby above, woolly underneath. *Heads* apically crowded, cylindric, glabrous; their scales oblong, obtuse.

(Fig. in Eng. & Prantl, iv, 5, p. 184, L.)

(Brazil, etc.); N. Patagon., by mouths of Rio Negro.

30. LUCILIA Cass.

Gray, woolly herbs, allied to *Gnaphalium*. *Heads* few, rather large, elongated. Involucres many-seriate, their scales long, scarious. Receptacle naked. *Flowers* all fertile, the females very slender, surrounding, and more numerous than, the hermaphrodites. *Achenes* silky, some of the hairs often elongate, like an extra-pappus.

Species 25, S. Amer.

L. ACUTIFOLIA Cass.

Leaves lanceolate-linear, acute, tomentose. *Pappus-setæ* finely serrulate.

(Fig. in Eng. & Prantl, iv, 5, p. 184, M.)

(Andes of Peru and Chili); N. Patagon., by Rio Negro.

31. GNAPHALIUM Linn. Cudweed, Everlasting.

Chiefly woolly herbs, with alternate *leaves* and discoid *heads* of pistillate and perfect flowers. *Involucral* scales several-seriate, their points dry. *Receptacle* naked. *Anthers* tailed. *Pappus* single, of capillary bristles. Achenes oblong or obovate, not ribbed.

Species 120, widely distributed. (J. D. Hooker, in *Flora Antarctica*, questions the specific validity of many of the species.)

KEY TO THE SPECIES.

A. Glabrous.

b. Decumbent, 4 cm. Leafy at base, less so above. Heads capitate, large. *antarcticum*.

b2. Undershrub, woolly upwards. Leaves small, obovate-rotund. Heads 3–5, terminal. *serpyllifolium*.

A2. Hoary, erect or ascending. Lower leaves broad, spatulate, upper narrower.

b. Upper leaves subdecurrent. Floral leaves short, linear. Heads crowded, spiciform. *spicatum*.

b2. Upper leaves not decurrent. Heads in compound, axillary spikes. *axillare*.

A3. Hoary-villous.

b. Erect annual. Leaves linear or broader, acute. Spike leafy, terminal, and axillary glomerules. Scales purplish-tipped. *filagineum*.

b2. Slender, leafy stem. Leaves spatulate-linear-oblong. Heads 3–5, sessile in upper axils, as an interrupted spike. Scales dark-tipped. *spiciforme*.

A4. Glandular-tomentose, suffruticose, with short branches. Leaves oblong-spatulate, acute. Heads in compound, apical glomerules. Scales whitish. *frigidum*.

A5. Woody, branching, with a tomentose cross terminating the branches. *lycopodium*.

A6. Leaves green above, tomentose underneath. Heads crowded apically.

b. Leaves ovate-oblong, attenuate-petiolate, acuminate. Heads crowded at the top. *mucronatum*.

*b*2. Leaves linear spatulate, the upper oblong. Heads sessile in axils and spicate above.
c. Scales purplish upwards. *purpureum.*
*c*2. Scales apically rufous. Leaves oblong-spatulate, mucronate. *purpureum-sphacelatum.*
*b*3. Leaves dimorphous, the basal subspatulate, straight, the cauline falcate, crowded. Heads sessile in upper axils and densely spicate. *falcatum.*
*b*4. Erect or diffuse annual. Lower leaves subobovate, obtuse; upper leaves narrower, acute, semi-amplexicaul. Glomerules cymose. Scales acuminate. *luteo-album.*
*b*5. Stunted, 5 cm., with offsets. Leaves oblong-linear, lowest subspatulate. Heads 5, sessile, cymose. *magellanicum.*
*A*7. Woolly-tomentose.
b. Procumbent, 6 cm. tall. Heads few.
c. Leaves subovate, sparse. *affine.*
*c*2. Leaves sessile, linear-oblong. Stems filiform; flowers yellowish. *supinum.*
*b*2. Ascending. Leaves spatulate-lanceolate to linear, amplexicaul. Terminal glomerules. *montevidense.*
*b*3. Erect, simple.
c. Leaves linear-lanceolate, decurrent. Corymbs terminal, dense.
d. Leaves woolly on both surfaces. Heads paniculate. Scales pale yellow. *cheiranthifolium.*
*d*2. Leaves velvety above, tomentose underneath. Heads compactly crowded. Scales citrinous. *citrinum.*

1. Gnaphalium affine d'Urv.

Stem slender, herbaceous, procumbent, only 6 cm. high, much branching and leafy. The flowering branches ascending, sparsely leafy. *Heads* few, terminal, aggregate, narrowly cylindrical. *Involucral* scales lanceolate, acuminate. Base of pedicels and bract-like leaves immersed in wool.

Spegazzini notes 3 leading forms of this species: (1) *pusillum*, *leaves* ovate, obtuse; *scapes* with 1–3 leaves and minute, crowded heads; (2) *parvulum*, *leaves* narrower, acutish; *scapes* naked or with strict leaves, heads more lax; (3) *medium*, *leaves* obovate to subspatulate, apically rounded; *scapes* slender, heads minute, bracteolate, crowded to interruptedly spicate.

Patagon., Chubut; Magellan; Fuegia; Navarin I.; Falklands.

2. G. antarcticum Hook. f.

Low, glabrous. *Stem* decumbent 3–5 cm. high, leafy at base, sparsely leafy above. *Heads* subcapitate, rather large. *Involucre* scales lanceolate, acuminate, scarious, glabrous, pale brown. *Achenes* glabrous. Pappus subpilose at base.

Falklands, concealed in grass.

3. GNAPHALIUM AXILLARE Remy.

Erect, subsimple; stem and leaves hoary. *Basal leaves* spatulate, mucronulate; cauline linear-mucronulate, non-decurrent; the lowest bearing in their axils a spike of heads. *Spike* short-peduncled, long and interrupted, compound. *Involucre* ovate-oblong, the outer scales oval, acute; the inner oblong-linear, green at base, yellowish and obtuse at apex.

S. Patagon., by Dusén at Puerto Madryn; Golfo de San Jorge.

4. G. CHEIRANTHIFOLIUM Lam.

The erect, simple, herbaceous *stem* and the *leaves* on both surfaces hoary-woolly. *Leaves* decurrent, linear-lanceolate, acute, undulate-crisp, floral branches panicled. *Heads* terminally crowded, semiglobose-campanulate. *Involucral* scales scarious, shining, pale yellow, oblong-linear, scarcely acute. (Central flowers hermaphrodite.)

(Montevideo, etc.); S. Patagon., by Rio Sta. Cruz.

5. G. CITRINUM Hook. & Arn. (= *cheiranthifolium* fide Ind. Kew.).

Herbaceous, erect, tomentose. *Leaves* very decurrent, linear-lanceolate, acute, velvety above, white-tomentose underneath. Corymbs terminal; *heads* crowded, ovate-campanulate. *Involucral* scales oblong, obtuse, citrinous, shining.

(Chili); Patagon., Golfo de San Jorge; Magellan.

6. G. FALCATUM Lam.

White-woolly, with many simple *stems* arising from the base. Radical *leaves* subspatulate, obtuse, straight; cauline crowded, falcate-arcuate. *Heads* sessile in the upper axils, and crowded in a *spike*. *Involucral* scales linear, glabrous, red-tipped.

Magellan.

7. G. FILAGINEUM DC.

Villous-hoary, erect, ascending, herbaceous annual. *Leaves* sessile, linear to linear-lanceolate, acute, villous-hoary both surfaces. *Spike* leafy, terminal, interrupted. *Glomerules* crowded at the axils, much shorter than the leaf. *Involucral* scales lanceolate, acute, purplish.

(Brazil); Patagon., along Rio Negro and Rio Chico de la Sta. Cruz.

8. GNAPHALIUM FRIGIDUM Wedd.

Glandular-tomentose, from a woody, branching rhizome, cespitose. *Stems* or branches short, decumbent or diffuse, and ascending, glomeruliferous at apex. *Leaves* oblong-spatulate or lanceolate, acute, not (?) decurrent. *Heads* densely glomerate, glomerules solitary. *Involucre* hemispherical, scales scarious, obtuse, sordid-whitish. Female flowers very many; disk-flowers hermaphrodite, about 18, with *pappus-setæ* coarsely thickened.

(Bolivia, etc., at snow-level); S. Patagon., by Hatcher in Cordilleras, Feb. 16, 1897.

A specimen in Gray Herbarium from Peruvian Andes at 14,000 feet (4,200 meters) above sea-level, is marked "var. *foliis angustioribus.*"

9. G. LUTEO-ALBUM Linn.

White-woolly, annual herb, with erect, simple or diffusely branching stem. Lowest *leaves* obovate or oblong-spatulate, obtuse; cauline semi-amplexicaul, oblong-linear or lanceolate, acute. *Heads* glomerate-cymose. *Involucral* scales scarious-hyaline, stramineous, acuminate.

(Cosmopolitan); N. Patagon., in sandy and damp places.

10. G. LYCOPODIUM Pers.

Stem woody, branching, the tops of the branches with thin, dense tomentum, forming a cross. ("Is it *Lucilia* or *Oligandra?*" DC.)

Magellan.

11. G. MAGELLANICUM Sch. Bip.

Stunted, 5 cm. high, with very short offsets. *Leaves* oblong-linear, the lowest subspatulate; villous-tomentose on both surfaces. *Heads* 5–6, sessile, cymose. *Involucre* generally half as long as the pappus; its scales glabrous, weak, straw-brown, ovate, oblong, obtuse, striate, subincised above. *Achenes* cylindraceous, sparsely hirt. The male plants unknown.

Magellan; at Punta Arenas by the seaside.

12. G. MONTEVIDENSE Spreng.

Stem herbaceous, ascending, simple, woolly. *Leaves* sparse, amplexicaul, spatulate-lanceolate, linear, acutish, plane, woolly. *Heads* sessile in terminal glomerules; involucres yellow.

(Montevideo); Chubut, in rocky places.

13. GNAPHALIUM MUCRONATUM Phil.

Perennial. *Stems* many, white-woolly. *Leaves* green above, hoary-tomentose underneath, obovate-oblong, attenuate to a kind of petiole, acuminate. *Heads* crowded at top of the stems. *Involucral* scales apically fuscous.

(Chili); W. Patagon., by Rio Palena; E. Patagon., near Rio San Martin. (Dusén.)

(*G. mucronatum* Berg. is *Helichrysum mucronatum* Less. of S. Afr.)

14. G. PURPUREUM Linn. (*P. americanum* Mill.)

Herbaceous annual or biennial, with simple, erect stem, tomentose. *Leaves* linear-spatulate; upper ones oblong, tomentose underneath, webby-glabrate on upper surface, sessile, or the lowest narrowed to a petiole. *Heads* sessile, subspicate in the upper axils and terminally. *Involucral* scales scarious, yellowish-brown or purplish, lance-oblong, acutish, the outer woolly at the base. *Achenes* roughish. *Pappus* bristles united at the base.

(Tropics and subtrop.); about Ajo (S. E. Arg.).

Patagon., by Rio Sta. Cruz; Magellan; Fuegia.

15. G. PURPUREUM SPHACELATUM (H.B.K.).

Silky-woolly. *Leaves* oblong-spatulate, mucronate. *Heads* crowded in the upper axils, in a rather interrupted leafy spike. *Involucral* scales linear, apically rufous.

S. Patagon., by Rio Sta. Cruz.

16. G. SERPYLLIFOLIUM Remy.

Suffruticose and glabrous below, with many slender stems; woolly upwards. *Leaves* small, obovate-rotund, the upper subspatulate, obtuse, mucronulate, non-decurrent, woolly both sides. *Heads* terminal, few (3–5). *Involucral* scales linear, acute, sphacelate.

(Argentina); S. Patagon., by Rio Sta. Cruz.

17. G. SPICATUM Lam.

Stem erect or ascending, hoary. *Leaves* narrowly oblong-spatulate, the lower broader, the upper subdecurrent, glabrous or webby on the upper surface. Floral leaves shorter, linear. (Fig. 97.)

(Quito; Brazil); S. Patagon., Falklands; Fuegia. "Abundant and variable."

Var. with all the *leaves* narrowed to a long petiole and the flowers crowded in subsessile *heads*.

Chonos Archip.

18. GNAPHALIUM SPICIFORME Sch. Bip.

Perennial. *Stems* several, herbaceous, a span high, ascending, slender, leafy, ending in an interrupted spike. *Leaves* spatulate, linear-oblong, hoary, webby-villous. *Heads* 3–5, sessile in the upper axils, cylindraceous. *Involucral* scales oblong-lanceolate, obtuse, blackish brown, 15-flowered, of which 12 are filiform females, and 3 are hermaphrodite, tubular and 5-toothed.

Magellan, by Punta Arenas.

FIG. 97.

Gnaphalium spicatum. — Spike, slightly reduced; also ray-flower (on left), disk-flower (on right), and receptacle with involucre (below). (From *Flora antarctica.*)

19. G. SUPINUM Linn. Dwarf Cudweed.

Low, herbaceous perennial, 3–7 cm. high, with simple, filiform *stem*, and sessile, linear, oblong, webby-tomentose *leaves*. *Heads* few, subsessile amid the upper leaves, oblong. *Involucral* scales oblong, acuminate. *Flowers* yellowish. *Pappus* bristles distinct. *Achenes* puberulous.

Alpine regions of Eurasia and N. Amer.

S. Fuegia, about Ushuaia, at elevations.

G. SUPINUM SUBACAULE Wahl.

Stem shorter than the leaves, and *heads* concealed by the leaves.

32. ADENOCAULON Hook.

Herbs, glandular especially at the inflorescence. *Stems* tall, sparsely branching, with few or no leaves upwards. Basal leaves long-petioled, white-tomentose below. *Heads* small, in a large panicle, disciform, heterogamous, 4–7 females surrounding as many sterile hermaphrodites. *Involucre* broad, its scales few (5), subequal, herbaceous. Receptacle naked. *Anthers* basally entire or minutely toothed. *Styles* of female flowers with short, broad branches. *Achenes* costate, gland-bearing. *Pappus* none.

Species 2, *A. bicolor* Hook. in Himalaya, Japan, and N. Amer., and the following. A case of discontinuity. (Fig. in Eng. & Prantl, iv, 5, p. 206, G–L.)

ADENOCAULON CHILENSE Less. (*A. lechleri* Sch. Bip.)

Leaves largely oval, rounded or subcordate at their base, slightly toothed, or entire at their margin.

(Chili); Patagon., Chubut; Magellan; S. Fuegia, at Ushuaia.

33. PARTHENIUM Linn.

Mostly hairy, or hoary herbs or shrubs, with alternate *leaves*, and small corymbose *heads* of both tubular and radiate, white or yellow flowers. *Involucre* broad, its scales 2–3-seriate, appressed, subequal. Chaff surrounding the disk-flowers. *Ray-flowers* about 5, their ligules short, 2-lobed. Disk-flowers sterile. *Anthers* basi-entire. *Achenes* compressed, bearing the persistent rays and *pappus* of 2–3 awns.

Species 10, N. Amer. to northern part of S. Amer.

P. HYSTEROPHORUS Linn.

Herbaceous annual, hispid below, hoary at top. *Leaves* variously bipinnatipartite. *Involucral* scales acute. *Pappus-scales* oval-oblong, obtuse, membranaceous. (Fig. in Eng. & Prantl, iv, 5, p. 114, M, N.)

(Tex., by Mexico and W. Indies to S. Amer.; also Mauritius.) N. Patagon., near Rio Negro.

34. AMBROSIA Linn. American Ragweed.

Monœcious or dicœcious branching herbs or shrubs, with small *heads* of green flowers, the staminate in spikes or racemes, the pistillate solitary or few in the axils. Pistillate heads 1-flowered, with 4–8 spines, without petals or pappus. Staminate heads many-flowered, often with filiform chaff, scarcely synantherous. (*Flowers* so far *reduced* as to have lost the chief characters of *Compositæ*, the female flowers being naked and not strictly capitate, and the males not having the anthers united.) (Fig. in Eng. & Prantl, iv, 5, p. 222.)

Species 12, chiefly American.

1. AMBROSIA SCABRA Hook. & Arn.

Stem scabrid. *Leaves* pinnate, callous-scabrid on the upper surface, hirsute-pubescent underneath; segments linear-lanceolate, acute, the lower incised-pinnatifid. *Racemes* solitary, sometimes becoming a leafy panicle.

(Buenos Ayres, etc., in pastures); N. Patagon., by Rio Negro.

2. A. TENUIFOLIA Spreng.

Pilose; lower *leaves* thrice-pinnatifid, with linear segments. *Racemes* solitary, copiously paniculate. Male involucre with subentire orifice; female involucre hard, sparsely tubercled.

Annual herb, 60–90 cm. high, copiously branching. (Argentina); N. Patagon., by Rio Negro.

35. XANTHIUM Linn. Cockle-bur.

Rough, monœcious annuals, with small *heads* of greenish, discoid flowers, the male-heads many-flowered, clustered at the ends of the branches, the females axillary, with 2 apetalous flowers. Males involucrate by distinct scales, the filaments united but anthers separate, the receptacle chaffy. Female heads with closed involucre covered by *hooked spines*. *Corolla* none. *Pappus* none. Species 5, widely distributed. (Fig. in Eng. & Prantl, iv, 5, p. 223.)

1. X. AMBROSIOIDES Hook. & Arn.

Spinose, tomentose-hoary. *Stem* procumbent. *Leaves* bipinnatifid, the segments oblong, obtuse, marginally revolute. Female head solitary, its spines slender, setiform, patent, apically hooked; the terminal spine stout and straight.

It has the foliage of *Ambrosia* with the fruit of *Xanthium*. A *var.* has the female head with no stout spine.

N. Patagon. in fields by Rio Negro.

2. X. ITALICUM Moretti. (*X. macrocarpum* DC.)

Leaves cordate, cuneate in the sinus, 3-lobed, toothed. *Fruiting involucre* ovate-oblong, hispid between the spines and at the base of the beaks, which are apically hooked.

N. Patagon., banks of Rio Negro.

3. Xanthium spinosum Linn.

Strong, 3-partite *spines* at the base of the leaves, which are 3-lobate, minutely puberulous above, hoary along the nerves and underneath. *Spines* yellow, 25 mm. long.

(Eur. and N. Amer.); N. Patagon.; the roasted fruits are used for making a drink like coffee.

36. ECLIPTA Linn.

Branching herbs, with opposite *leaves* and small peduncled, terminal and axillary *heads* of tubular and radiate, whitish flowers. *Involucre* broad, its scales usually 2-seriate, herbaceous. *Receptacle* with awn-like chaff subtending the achenes. Ray-flowers fertile; disk flowers perfect, mostly fertile, and mostly 4-toothed. *Style-branches* obtuse or with triangular tips. *Achenes* thick, with rough sides. *Pappus* none, or a few teeth.

Species 4, chiefly tropical.

E. alba Hassk.

Rough annual, 60 cm. high. *Leaves* nearly lanceolate, denticulate or entire, narrowed to a sessile base, or some petioled. *Rays* short. *Achenes* 4-toothed.

(Fig. in Eng. & Prantl, iv, 5, p. 227, E–H.)

(Trop. Amer., naturalized in U. S.); N. Patagon., by Rio Negro.

37. WEDELIA Jacq.

Rough herbs or undershrubs, with opposite *leaves* and mediocre heads, pediceled at the ends of branches or axillary. *Flowers* yellow, radiate, all usually fertile. *Involucral* scales 2-seriate, the outer green. Chaff embracing the flowers. *Anthers* basi-entire or sagittate. *Style-branches* with acute appendages. *Achenes* thick, laterally compressed, or in the ray triquetrous; glabrous or hairy or tubercled. *Pappus* mostly cup-like or with caducous awns. (Fig. in Eng. & Prantl, iv, 5, p. 230, A.)

Species 60, in warm climates.

W. buphthalmiflora Ltz.

Many erect *stems* from the woody root; branching decussately or sparsely, with gray cortex, 50 cm. high. *Leaves* narrow, lanceolate,

entire, or broader and serrate, 3-nerved, revolute edged, 6 cm. long. *Flower-heads* solitary, terminal, rather large, above the leaves. *Involucral* scales 4-seriate, the inner larger, passing into the receptacle-pales. *Achenes* compressed, not winged, silky. *Pappus* of 3 pales, scarcely united, lacerate above. Some short neuter flowers.

N. Patagon., by Rio Negro.

38. SPILANTHES Jacq.

Branching herbs, with opposite *leaves* and rather small, long-peduncled, discoid and radiate *heads*, or rayless. Involucre with green scales, 2-seriate. *Receptacle* convex or elongated, chaffy about the achenes. Anthers basitruncate. *Style-branches* of the disk long, often tufted. *Achenes* 3-sided (ray), or compressed. *Pappus* of 1–3 or more awns.

Species 30, in warm regions. (Fig. in Eng. & Prantl, iv, 5, p. 237.)

S. ARNICOIDES DC. (*S. heleniοides* Hook & Arn.)

Stem creeping, ascending, hirtellous, sparsely branching. *Leaves* crowded at base, opposite, attenuate-cuneate to a long petiole, elliptical or ovate-lanceolate, subdentate, smooth. *Peduncle* long, 1-headed, erect, sparsely puberulous; *head* subglobose. *Involucral* scales about 12, oval-oblong, obtuse. *Ligules* 12–15, three times as long as the involucre. *Achenes* of ray abortive, of disk ciliate, 2-awned. *Corolla* intense yellow.

(Brazil); N. Patagon., a campos plant; "nim-nim," its root is chewed to allay thirst.

S. ARNICOIDES LEPTOPHYLLA (DC.).

N. Patagon., by Rio Negro.

39. VERBESINA Linn. (including *Ximenesia* Cass.).

Mostly pubescent or scabrid herbs, with *heads* small to mid-sized, and broad *involucre* with few-seriate scales. *Receptacle* convex, chaffy, its chaff enclosing the disk-flowers. Ray-flowers ligulate, white, pistillate or neuter. *Style-branches* of disk with acute appendages; the disk-achenes flattened. *Pappus* of 1–3 subulate awns, sometimes with intermediate scales.

Species 50, American, from southern United States to Patagon.

VERBESINA AUSTRALIS (Hook & Arn.) Baker. (*Ximenesia microptera* DC.)

Annual, with stems not winged. *Leaves* alternate, dorsally white-tomentose; lower leaves deltoid-petiolate, sharply serrate, the upper sessile, basi-auriculate. *Heads* few, lax-corymbose. *Ligules* 10–12, large, showy. *Achenes* narrowly winged; awns short.

(Argentina, etc.); N. Patagon.; common along Rio Negro.

40. THELESPERMA Less.

Glabrous herbs, with opposite, linear or finely dissected *leaves* and long-peduncled, mid-sized *heads* of both tubular and radiate flowers, or rayless. *Involucre* broad, 2-seriate, the outer scales short, spreading, the inner connate half-way, their tips scarious. *Receptacle* chaffy. *Ray-flowers* neuter, yellow. Anthers basiobtuse. *Style-branches* obtuse. *Achenes* papillose on the back, wingless. *Pappus* of 2 retrorsely hispid awns or none.

Species 7, Amer., from southern United States to Patagon.

1. T. MEGAPOTAMICUM O. Ktze. (Spr. sub *Bidens*).

Leaves all bipinnatifid, linear-filiform, glabrous. *Heads* mostly in pairs, peduncled, erect, discoid. *Involucre* colored, as long as the disk. Achenes?

(Brazil; Argentina); N. Patagon., common along Rio Negro.

2. T. SCABIOSOIDES Less.

Herb from woody root, 60 cm. high, of habit of *Scabiosa columbaria gramuntia* DC. Glabrous, with many *stems* which are rigid, divided from below into a subtrichotomous panicle, with spreading branches and long peduncles. *Leaves* decussate, at least below, finely dissected; their segments linear to 16 mm. long; passing to upper, simple, sessile, linear leaves. *Heads* erect, homogamous. (Fig. in Eng. & Prantl, iv, 5, p. 240, E–F.)

(Uruguay, etc.); N. Patagon., by Rio Negro.

41. MADIA Molin. Tarweed.

Erect annuals, with entire *leaves*, and glandular, often scented pubescence. *Heads* mostly radiate and heterogamous. Involucral scales 1-

seriate, carinate, embracing the outer achenes. *Disk-flowers* tubular, 5-cleft, their styles appendaged. *Anthers* basiobtuse. *Achenes* of ray obovate-oblong, often laterally compressed and incurved. *Pappus* none.

Species 8, in Western N. Amer., and to Chili, etc.

MADIA SATIVA Molin.

Lower *leaves* opposite, upper alternate, semiamplexicaul, oblong, entire. (Fig. in Eng. & Prantl, iv, 5, p. 249, C.)

(Chili, where an oil is expressed from its seeds, and it is cultivated); Patagon.; Magellan; N. and E. Fuegia (Dusén, "a steppe plant; rather rare in Fuegia").

42. FLAVERIA Juss.

Herbs often yellowish, with opposite, narrow leaves and heads with few, to only 1, *flowers*, all fertile. *Involucral* scales 2–4, long, subequal, sometimes with small, outer scales. *Receptacle* naked. Ray-flowers with very short ligules. Anthers basiobtuse. *Style-branches* of disk truncate. *Achenes* 8–10-costate. *Pappus* none. *Corollas* yellow.

Species 8, of which 2 are spread over the whole tropics, especially in W. Amer. One of these, *F. contrayerva* Pers. (fig. in Eng. & Prantl, iv, 5, p. 259), is used as a vermifuge. *F. australasica* Hook., of tropical E. Australia, is allied to species in S. Amer., W. Indies and Florida.

A species (undescribed) belonging to S. Argentina may be expected in N. Patagon.

43. VILLANOVA Lag.

Diffuse, glandular, pubescent herbs, with at least the lower *leaves* opposite, dissected; and with small or midsized peduncled *heads* of yellow flowers *panicled or corymbose*. Ray- and disk-flowers usually fertile. *Involucre* broad, its scales few, subequal, green, subtending the ray-flowers. *Receptacle* small, naked. *Anthers* basisagittate. Style branches acute. *Achenes* cuneate-oblong, truncate, triquetrous, glabrous. Pappus none.

Species 8, Colorado to Patagon.

V. PINNATIFIDA Lag.

Annual, with ternatisect *leaves*, opposite below, alternate upwards, their segments pinnatifid.

Magellan.

44. ACTINELLA Pers.

Chiefly herbs, with alternate or radical *leaves*, entire or pinnately few-lobed. Heads terminating the branches, mostly radiate, heterogamous, yellow-rayed, resinous. *Involucre* broad, its scales 2–3-seriate, subequal, rigid. *Receptacle* convex, naked. *Anthers* entire or basisagittate. *Style-branches* dilated-truncate, pencilled. *Achenes* silky. *Pappus* of 5–12 awned, hyaline pales.

Species 17, N. Amer.

1. A. ANTHEMOIDES (Cass. sub *Hymenoxys*) Gray. (*Actinea anthemodes* O. Ktze.)

Heads discoid, homogamous. *Involucral* scales obovate-subspatulate. Not well known; referred by DC. and A. Gray to *Hymenoxys*, a subgenus, having double involucre, the outer short and connate. (Fig. in Eng. & Prantl, iv, 5, p. 256, R.) ("Achenial hairs bicuspidate," Speg. This character is common in many genera. See A. Gray's Revision of Compositæ on genus *Townsendia*.)

N. Patagon., along Rio Negro.

2. A. HETEROPHYLLA (Juss. sub *Actinea Cephalophora* L.) H. & A. A. HETEROPHYLLA LATIFOLIA O. Ktze.

Leaves narrowly lanceolate, the upper broader, 4 mm., entire.

Patagon.

45. GAILLARDIA Foug.

Pubescent herbs, with alternate or basal *leaves,* and large, peduncled, radiate *heads*, the rays cuneate, variously colored, or wanting. Involucre broad, 2–3-seriate, herbaceous-tipped. *Receptacle* convex or globose, often bristly. Teeth of disk-flowers with jointed hairs. *Anthers* basisagittate. *Style-branches* appendaged. *Achenes* turbinate, 5-costate, villous. *Pappus-scales* 6–12, awned, 1-nerved, exceeding the achene.

Species 12, chiefly in Central and N. Amer.

1. G. DONIANA Gris. (*Cephalophora doniana* H. & A.)

Hoary, suffruticose. *Leaves* linear, entire, acute. *Involucral* scales appressed. *Heads* radiate; ray-corollas 3-lobed, of same color with the disk. *Pappus-pales* 6–8, rather short. *Achene* yellow-silky.

Argentina.

2. GAILLARDIA DONIANA DISCOIDEA Gris.

Radiate; but by the setose receptacle and the style-branches having a long, hirt appendage allied to *G. scabiosoides*. Plant 30 cm. tall. Leaves narrowly or broadly lanceolate-elliptical, acuminate, entire, 5 cm. by 4 cm.

(Argentina); N. Patagon.

3. G. MEGAPOTAMICA (Spr.) Baker.

Stems inconspicuously pilose. *Leaves* lanceolate, entire. *Heads* discoid, solitary, long-peduncled. *Involucral* scales lanceolate, shorter than the disk. *Pappus-pales* 9–10, lanceolate, 2–3 times larger than the achene.

The largest species: "Tschoïke catschu," Rhea-grass, its infusion is sudorific.

(S. Brazil and Argentina, near rivers); N. Patagon. and by Bahia Blanca.

4. G. SCABIOSOIDES Griseb. (= *G. megapotamica?*).

Heads discoid, solitary, long-peduncled. *Leaves* oblong, deeply pinnatifid; the segments lanceolate, entire or sparsely toothed. *Involucral* scales lanceolate, shorter than the disk. *Pappus-pales* 9–10, lanceolate, 2–3 times exceeding the achene. (Leaves varying, sometimes entire.)

(Argentina); N. Patagon.

5. G. SCABIOSOIDES RADIATA.

Stem 22 cm. high, leafy at base. *Leaves* bipinnatisect, ovate in outline, to 4 cm. long. *Ray* exsert, its ligules trifid.

(Argentina, common by rivers); N. Patagon.

46. TAGETES Linn. South American Marigold.

Glabrous herbs, with *oil-glands* in the involucres and in the leaves. *Leaves* mostly opposite and mostly pinnately dissected. *Flowers* yellow. *Involucre* cylindraceous, 1-seriate, connate. Receptacle naked. Ray-flowers entire or 2-cleft. *Anthers* basiobtuse. *Style-branches* truncate-tufted or briefly appendaged. *Achenes* linear, attenuate with a basal callus. *Pappus-pales* 5–6, differing.

Species 20, Mex. and S. Amer., often cultivated in gardens.

(DC. Prodr. gives as the generic character, "leaves opposite or alternate," and several of its species are cited with alternate leaves. Benth.

& Hook. and also Eng. & Prantl, say "leaves opposite," apparently by an oversight, as Benth. & Hook. refer to *T. glandulifera* as in the genus.)

TAGETES GLANDULIFERA Schrk.

Heavy-scented annuals, with erect stem and short branches. *Leaves* alternate, pinnatisect; their segments linear-lanceolate, acuminate both ways, serrate, 6–8 pairs and a terminal; upper leaves subdecurrent, the lower lobes of each aristate and small. *Heads* corymbose-fasciculate, about 7 of them ending a branch. *Ligules* 3, small.

(S. Brazil; Argentina; Chili); N. Patagon., in cultivated places by Rio Negro.

47. DYSODIA Cav.

Mostly annual, strong-scented, branching herbs, with dissected, glanduliferous *leaves* and small, radiate *heads* of yellow flowers. *Involucral* scales 1-seriate, partly united, mostly with small outer scales. *Receptacle* pubescent. *Rays* short. *Anthers* basally entire or toothed. *Style-branches* long, hirsute. *Achenes* obpyramidal, 3–5-angled, striate. *Pappus-scales* 10 or more, parted into bristles.

Species 34, Southern and Western U. S. to Mex., and 1 in S. Amer.

D. BELENIDIUM (DC. sub *Hymenatherum* as a genus).

Erect undershrub, with basal *leaves* opposite, pinnatipartite, having 5 pairs of lateral lobes and a longer terminal, all subulate, rigid. *Pedicels* long, 1-headed, naked. *Involucral* scales united throughout. *Pappus-scales* 10–20, ending in 1–7 awns.

(Chili; Argentina); N. Patagon., in rocky places by Rio Negro.

48. ANTHEMIS Linn. Camomile.

Herbs or undershrubs, often scented, with pinnatifid or dissected, alternate *leaves*, and rather large, peduncled *heads* of yellow disk-flowers, and white or yellow rays ending the branches. *Involucre* hemispheric, its scales imbricated, several-seriate, scarious-margined, shorter outwards. *Receptacle* convex, with chaff subtending the disk-flowers. *Anthers* basi-obtuse. Style-branches in the disk truncate. *Achenes* oblong, ribbed. *Pappus* none, or a ring.

Species 100, Europe and Mediterr. region; a few introduced to Amer. (Fig. in Eng. & Prantl, iv, 5, p. 271.)

ANTHEMIS COTULA Linn.

Glabrous, glandular, fetid annual. *Leaves* finely dissected into subfiliform spreading segments. Ray-flowers 10–18, white, neutral.

(Eur., naturalized in N. and S. Amer.); Patagon., at Rawson by mouth of Rio Chubut (Dusén). Near RR. Gallegos and Sta. Cruz.

49. ACHILLEA Linn. Yarrow.

Herbs, with erect, leafy *stem*, the *leaves* alternate, finely dissected or pinnatifid, or serrate; and terminal *corymbs* of small heads, with yellow disks and white or pink rays. *Involucral* scales few-seriate, imbricating, smaller outwards. *Receptacle* with subtending chaff. *Anthers* basi-obtuse. *Style-branches* truncate. *Achenes* oblong to obovate. *Pappus* none.

Species 80, in N. Temperate regions, especially of Old World.

A. MILLEFOLIUM Linn.

Leaves finely dissected into narrow, pinnatifid segments, tomentose or glabrous. *Involucre* ovoid.

(N. Temp. regions of both Hemispheres, also in S. Austral. and N. Zeal.); Magellan (Dusén).

50. COTULA Linn.

Low, cespitose or creeping herbs, with alternate, pinnately divided or toothed *leaves;* and rather small, heterogamous, disciform *heads.* *Involucre* broad, 2-seriate. *Receptacle* naked. Corollas of outer flowers conical or none; of disk 4-merous. *Anthers* basi-obtuse. *Style-branches* truncate or obtuse. *Achenes* compressed. *Pappus* none, or auriculiform.

Species 40, in temperate and warmer parts of Old World; also with the section *Leptinella*, including 18 species, in the Southern Hemisphere.

(LEPTINELLA, subgenus.)

Receptacle at length conical; the female flowers several-seriate, the achenes 2-costate or 2-winged.

Species 18, in Australia, New Zeal. and Chatham I. and the following which are most of them, common to Australia and Western America.

1. C. ACÆNOIDES (Hook. & Arn. sub *Leptinella*).

Stoloniferous, subvillous. *Leaves* spatulate, pinnatifid, with oval segments, here and there incise-toothed; the lower smaller, the upper greater

and thin segments approximate. *Involucral* scales 5, in 1 series, scarious-margined. "No ligulate or marginal female flowers in ours" (H. & A.). "= *C. reptans*" (Index Kewensis).

(Australia); Fuegia, Ushuaia; Cape Horn; Staaten Id.; W. Patagon., at Cape Tres Montes.

Var. *major*. Less villous; *leaves* subglabrous, lobes distant. Head larger. At Valdivia. (*C. reptans* Benth. occurs in Australia and Tasmania, as also the var. *major*.)

2. COTULA AUSTRALIS (Less.) Hook. f.

Slender, much branched, 5–10 cm. high, flaccid, glabrous, hairy or woolly at nodes. *Leaves* 12–25 mm. long, pinnatifid once or twice; the lobes linear, entire. *Heads* minute, 2 mm. broad, on long, slender peduncles. *Involucral* scales 2-seriate, linear-oblong, membranous. Ray-flowers 3-seriate, pediceled; no corolla. *Achenes* obovate, winged, the wing apically bifid, glandular on inner side. Disk-flowers tubular, 4-toothed, glandular.

(N. Zeal., Tasmania; Australia; S. Africa; Tristan); Patagon. (?).

3. C. HOMBRONI Franchet.

"One-third the size of *C. scariosa* and much more velvety." *Leaves* with indistinct petiole, pinnatipartite, with segments contiguous, oboval, crenate or entire, long-prostrate, rooting. *Heads* 6 mm. in diameter; *involucral* scales glabrescent, 1–3 outer ovate-deltoid, the inner orbiculate, black-tipped.

Magellan, by Hombron.

4. C. PEDUNCULARIS (DC.).

Small, glabrous, prostrate, creeping. *Leaves* petiolate, sinuate-pinnatifid, sharply toothed, the segments very narrow. *Peduncles* terminal, solitary or corymbed. *Involucral* scales imbricating, orbicular, pale-margined. Ray-flowers bilabiate.

(Quito); Patagon., by Savatier.

[C. PLUMOSA.

Hirsute, with long, lax hairs. *Leaves* long-petiolate, linear, oblong, obtuse, tripinnatifid, the ultimate segments subulate. Terminal and lat-

eral peduncles solitary, as long as the petiole. *Involucre* 1-seriate. Female corollas cordate-ovate. *Flowers* not glandular.

Found in N. Zeal., Auckland I. and Kerguelen; not yet found in Amer.

"One of the few plants common to Lord Auckland's Group and Kerguelen's Land which do not exist in Fuegia." (J. D. Hooker.)]

5. COTULA REPTANS Benth.

Diœcious, stoloniferous, subvillous. *Leaves* petiolate, pinnatisect; the segments oval-oblong, subarcuate, incised-toothed in places; the lower leaves smaller. *Heads* long-peduncled. Male involucral scales 5–6, in 1 series; female 20, in 3 series.

S. Patagon., Gregory Bay, RR. Gallegos and Sta. Cruz.

(*C. reptans* Boj. is *Sphæranthus cotuloides* of Madagascar.)

6. C. SCARIOSA (*Leptinella scariosa* Cass.) Franch.

Stem prostrate, rooting here and there, the leafy branches villous. *Leaves* glabriusculous; the lowest linear, petiole-form at their base, at their apex lyrate-pinnatifid. *Peduncle* scapiform, villous. *Rays* ligulate.

(S. Chili); E. and W. Magellan to Cape Horn; chiefly in forest regions.

51. ABROTANELLA Cass.

Glabrous, dwarf perennials, with small, alternate, entire, fleshy *leaves*, and small, terminal *heads* sessile among the leaves, solitary or crowded, disciform and heterogamous. *Involucre* campanulate, 2–3-seriate. *Receptacle* naked. Female corollas 3–4-toothed; hermaphrodites 4-cleft. *Anthers* basiobtuse. *Style-branches* short, truncate. *Achenes* glabrous, dorsally compressed or 4-angular. *Pappus* none, or coroniform, or 4 teeth or bristles.

Species 12, N. Zeal., Auckland I.; Campbell I.; Australia (Victoria); Rodriguez I.; Fuegia.

1. A. EMARGINATA Cass.

Moss-like herb. *Leaves* imbricately crowded, broad, scarious-edged, bifid at apex. *Heads* solitary, terminal.

Magellan to Cape Horn; abundant in the Falklands.

2. A. LINEARIFOLIA A. Gray.

Small, lax-cespitose, with linear or broader, entire *leaves*, the upper as long as the peduncled head. *Involucral* scales oval, 2–3-nerved. Female

flowers 2–3; hermaphrodites 6–8; all fertile. *Achenes* glabrous, long-obovate, 4-costate. *Pappus* truncate, 4-toothed or 4-awned.

Fuegia, near Cape Horn.

3. Abrotanella submarginata A. Gray.

Pulvinate-cespitose. *Leaves* many, linear, callous-margined, spreading, obtuse. *Heads* solitary, few-flowered. *Involucral* scales 1-nerved. *Achenes* obscurely 3–4-nerved. *Pappus* coroniform.

Magellan; Fuegia, by Orange Harbor.

52. ARTEMISIA Linn. Wormwood.

Odorous herbs or shrubs, often hoary, with alternate *leaves*, and small discoid *heads* of greenish or yellowish flowers. *Involucral* scales few-seriate, shorter outwards. *Receptacle* without chaff. *Anthers* basi-obtuse. *Style-branches* truncate. *Achenes* oblong, 2-ribbed or striate, usually with a superior disk. *Pappus* none. (Fig. in Eng. & Prantl, iv, 5, p. 281.)

Species 200, chiefly of the Northern Hemisphere.

A. magellanica Sch. Bip.

Herbaceous, 1–many-stemmed; *stems* leafy, spicate, racemose. *Leaves* pinnatipartite, segments 2–3, or only 1 pair; oblong-lanceolate, acute, with resinous dots. *Raceme* perfoliate, simple or branching below. *Heads* axillary upwards, subsessile, erect, many-flowered. *Involucral* scales rounded, their margin pale-yellow, scarious. *Achenes* ovate, cuneate, glabrous. Pappus none.

(Chili; Argentina); Patagon.; Chubut; Rio Sta. Cruz; Magellan; E. Fuegia (Dusén, "a steppe-plant").

53. MELALEMA Hook. f.

Low, cespitose herb, with alternate, spatulate, entire, crowded *leaves*, tomentose underneath; and solitary, sessile, discoid *heads* among the upper leaves. *Involucral* scales many-seriate, silvery-tomentose, apically sphacelate. *Receptacle* naked. *Anthers* basi-obtuse. *Style-branches* linear, truncate. Marginal flowers female, tubular. *Achenes* oblong, glabrous. *Pappus* setose.

Species only 1, viz:

MELALEMA HUMIFUSUM Hook. f.

Prostrate, emitting long fibers; with leafy branches.

Fuegia, on mountain top near Blossom Bay.

54. CULCITIUM Humb. & Bonp.

Perennial herbs, with radical or alternate, usually entire *leaves;* and mediocre or large, yellow, monogamous, discoid *heads*. *Involucre* broad, its scales many-seriate, smaller outwards. *Receptacle* naked. *Anthers* basally entire or subentire. *Style-branches* truncate, pencilled. *Achenes* oblong-linear, many-striate, glabrous. *Pappus-setæ* copious.

Species 14, Andine. (Fig. in Eng. & Prantl, iv, p. 292.)

1. C. MAGELLANICUM Homb. & Jacq.

Entirely silky-tomentose. *Leaves* radical, linear-lanceolate or narrower, long, acute, appressed-hairy, the margins revolute. *Scapes* with 1 head: the involucre woolly.

S. Patagon., Gregory Bay, Magellan; by Hatcher at Cabo Negro, Jan. 13; chiefly in the steppes; Fuegia, Ushuaia, Navarin I.

2. C. SESSILE Speg.

Pulvinate-cespitose, 5–10 cm. high, 20 cm. broad, appressed-silvery-silky. *Leaves* crowded, linear, entire, revolute-margined; their apex attenuate, acute, with a setula; their base subattenuate and spreading to a villous periclad. *Heads* solitary on the branches, sessile amid the leaves, campanulate, erect. *Involucral* scales woolly, shorter than the disk. *Corolla* ochroleucous. Stigmas ferruginous.

Patagon., by Golfo de San Jorge.

55. SENECIO Linn. Groundsel.

Plants of varying habit, usually herbs, in temperate climates. *Heads* radiate (or sometimes rayless). *Involucral* scales 1–2-seriate, erect, subequal, or with small, outer bracteoles. *Receptacle* naked. *Anthers* basi-obtuse, or nearly so. *Style-branches* often spreading, truncate, pencilled. *Achenes* 5–10-costate. *Pappus-setæ* copious, fine, entire to barbellate.

Species 1,200, cosmopolitan; with great variety as to size of heads, etc. (*S. jacobæa* L. is the troublesome ragweed of Britain, not the American ragweed; *S. vulgaris* L. is the British groundsel, the favorite of the

canary-bird; *S. johnstoni* Oliv. of tropical Africa is a tree; and *S. humillimus* Sch. Bip. of the Andes is low and cespitose.)

KEY TO THE SPECIES.

A. Monocephali. Heads solitary on the scape or branches.
b. Heads discoid.
c. Herbs.
d. Glabrous, with scape. Leaves fleshy, linear-spatulate, toothed. Involucral tips sphacelate. *kingii.*
d2. Low, many-stemmed perennial, tomentose when young. Leaves linear, the upper few, setaceous. Involucre green. *magellanicus.*
c2. More or less shrubby.
d. Leaves glabrous-warty, narrow, broader toward apex. Branches nearly naked. Heads calyculate. Flowers 1 cm. long. *verruculosus.*
d2. Leaves glabrous on underside, very narrow, smaller upwards. Low, cespitose. *miser-tehuelches.*
d3. Somewhat webby; leaves linear.
e. Upper leaves broader, 3-lobed. Heads "homogamous." *allœophyllus.*
e2. Branches naked above. Leaves often 2-toothed. *beaufilsii.*
d4. Hoary undershrub. Leaves crowded, spatulate, with a long sheath. *vaginæfolius.*
d5. Leaves crowded at base, densely glandular, small, linear. Branches scape-like. Heads broad, sparsely calyculate. Flowers 6 mm. long. *hatcherianus.*
b2. Heads radiate.
c. Stems or branches scapiform upwards.
d. Fleshy rhizome, sending up leafy shoots and leafless scapes. Leaves spatulate, petiolate. Heads large. *kurtzii.*
d2. Low, tomentose; stems leafy below, scapiform above. Head calyculate.
e. Leaves linear, scarious, broader upwards. *tunicatus.*
e2. Leaves about oblong, black-tipped. *pœppigii.*
d3. Glabrous. Leaves spatulate, trifurcate, some fasciculate. *trifurcatus.*
c2. Heads terminal on branches.
d. Branches few-leaved to naked upwards.
e. Webby. Leaves linear-spatulate. Heads small. *alboffiana.*
e2. Subtomentose. Leaves linear, entire, obtuse; upper fewer, acute. *argenteus.*
e3. Woolly. Leaves linear, spatulate, 3-toothed. *ceratophyllus.*
e4. Glabrous. Leaves narrow-linear. Head long-stalked, calyculate. Achene hispid. *laricifolius.*
e5. Glabrous, branches many, leafless above. Leaves subspatulate, 3–5-cleft. Ligules scarlet. *hypsophilus.*
e6. Silky. Leaves narrow-linear, crowded at base of branches, these nearly leafless above.
f. Involucral scales 20, acuminate. *morenouis.*
f2. Involucral scales about 15, acute, tomentose. *sericeo-uitens.*

e7. Puberulous. Leaves linear, entire, the upper few small. Involucral tips subus-
tulate. *polyphyllus.*
d2. Branching profuse. Woolly shrubs.
e. Leaves narrow, deeply 3-cleft. *eightsii.*
e2. Leaves cuneate, 3-lobed, etc. *darwinii.*
e3. Leaves linear, entire. *chilensis.*
d3. Branching dichotomous, tomentose. Leaves fleshy, linear; with axillary fas-
cicles. *fasciculatus.*
d4. Erect, glabrous, with large heads on leafy branches. Leaves linear, to obovate,
entire. *littoralis.*
A2. Oligocephali. Heads usually 1–3, corymbed.
b. Discoid.
c. Tomentose perennial, with 1–8 mid-sized heads. Leaves oblong, dark-tipped.
micropifolius.
c2. Shrubs or undershrubs.
d. Low, with glabrous, fleshy, pectinate leaves. Stem long. *hauthalii.*
d2. Low, branching, with small, sessile leaves and heads. *nordenskjoldii.*
d3. Low, viscous. Leaves narrow-spatulate, wavy. *miser.*
d4. Erect, woolly. Leaves spatulate, entire. *leucomallus.*
b2. Radiate.
c. Glabrous herb. Leaves obovate, basi-cuneate. Heads 3. *cuneatus.*
c2. Glabrous shrub. Leaves subcylindrical. *pachyphyllus.*
c3. Woolly shrub. Leaves sublanceolate, revolute. *falklandicus.*
c4. Hoary. Stem scape-like. Leaves oval, fleshy.
d. Achenes hispid. *gillesii.*
d2. Achenes white-pubescent. *gillesianus.*
A3. Subcorymbosi. Heads few, corymbed.
b. Discoid.
c. Herb. Tomentose. Leaves oblong, dark-tipped. *micropifolius.*
c2. Undershrubs.
d. Glandular, leafy upwards; leaves subsphacelate, toothed. *dumosus.*
d2. Subglabrous, erect. Bracteolate.
e. Leaves very narrow, revolute. Heads long-stalked. *longipes.*
e2. Leaves broad-linear, entire. *arnotti.*
d3. Webby to silvery. Leaves linear.
e. Leaves mostly crenate. Achenes puberulous. *psammophilus.*
e2. Leaves fleshy, naked upwards. *xanthoxylon.*
d4. Webby. Leaves linear-oblong, entire. Heads broad, calyculate.
(*patagonicus*) *microcephalus.*
d5. Leaves webby underneath, green above, linear, entire, fleshy. Branches woolly.
Heads calyculate. *lechleri.*
b2. Radiate.
c. Herbs.
d. Glabrous.
e. Leaves subspatulate, cuneate-petiolate, few. *cuneatus.*
e2. Leaves pinnatifid. Corymbs long-stalked. Achenes silky. *delfini.*

*d*2. Silky. Leaves narrow-linear, crowded at base. *palenæ.*

*c*2. More or less fruticose.

d. Glabrous. Leaves oblong-cuneate, toothed apically. Branches naked upwards. *hirthi.*

*d*2. Glabrous and calyculate.

e. Leaves linear, pinnatifid. Calyculus long. *chrysocomoides.*

*e*2. Leaves broader, pinnatipartite; segments 6–8 pairs. *desideratus.*

*e*3. Leaves linear-subulate, sometimes pinnatifid. Calyculus short. *subulatus.*

*e*4. Leaves linear, entire, attenuate. Pedicels long. Involucre black-tipped, floccose. *linariæfolius.*

*e*5. Leaves obovate to oblanceolate, pinnatifid. Involucre green. *dusenii.*

*d*3. Leaves crowded, pinnatipartite. *pinnatus.*

*d*4. Tomentose.

e. Leaves broad-linear.

f. Leaves acute, with recurved edges. Heads stalked, rather large. *andersoni.*

*f*2. Leaves obtuse. Heads 1–few. *flaccidus.*

*f*3. Leaves subpectinate, some with stipelliform lobes. *stipellatus.*

*e*2. Leaves broad-ovate, deeply pinnatifid. Heads broad, woolly. *candolleanus.*

*A*4. *Corymbosi.* Heads numerous, corymbed.

b. Discoid.

c. Herbs.

d. Woolly. Leaves ovate, crenate, the upper sessile, entire. Heads umbellately stalked. *candidans.*

*d*2. Glabrate, puberulent. Leaves pinnatifid. Achenes hoary. *vulgaris.*

*c*2. More or less fruticose.

d. Glabrous. Heads bracteolate.

e. Leaves about oblong, auricled. Involucre-tips floccose. *lævicaulis.*

*e*2. Upper leaves oblong-panduriform. Heads small, broad. *subpanduratus.*

*d*2. Hoary, becoming glabrous. Leaves linear, entire. *neæi.*

*d*3. Webby. Tall. Leaves oblong, revolute. *hyadesii.*

*b*2. Radiate.

c. Herbs.

d. Glabrous, bracteolate.

e. Leaves pinnatifid. *glaber.*

*e*2. Leaves rhombo-hastate, narrowing upwards. *hualtata.*

*d*2. Leaves glabrous-pubescent, subovate, the lower petiolate. Heads broad. *acanthifolius.*

*d*3. Lower leaves 2, oblong, petiolate; upper amplexicaul, somewhat webby. Heads rather large. *fistulosus.*

*d*4. Tall, woolly. Leaves lance-oblong, the upper sessile. Heads large, calyculate. *pulcher.*

*c*2. More or less fruticose.

d. Glabrous.
e. Leaves linear, entire or 2-toothed. Bracts crowded, setaceous. *ibari.*
e2. Leaves pinnately lobed. *incisus.*
e3. Leaves large, broad, pinnatifid, the upper amplexicaul. Tall. Heads mid-sized. *auriculatus.*
d2. Hoary-tomentose.
e. Leaves linear.
f. Branches becoming naked, white. *albicaulis.*
f2. Low. Silky tomentose when young. *sericeus.*
f3. Leaves fascicled, revolute-margined. Heads small, constricted. *danyausi.*
e2. Tall. Leaves oblong, basicordate. Heads large. *smithii.*
e3. Prostrate. Leaves rather narrow, often cuneate, trifid. *darwinii.*
b3. Radiate and calyculate. Shrubs.
c. Glabrous. Leaves linear, entire. *bracteolatus.*
c2. Glaucous-glabrous. Leaves pectinate. Heads tomentose. *ctenophyllus.*
c3. Tomentose. Leaves linear-subulate, entire. *caricifolius.*
c4. Scabrous. Leaves broad-linear. Entire. Heads broad. *limbardioides.*
A5. Paniculati. Heads numerous, panicled.
b. Discoid. Appressed, silky shrub. Leaves linear. *doeringii.*
b2. Subdiscoid. Glabrous herb. Leaves broad-lanceolate, basicordate. *otites.*
b3. Radiate.
c. Woolly herb. Leaves fleshy, subreniform, glabrate on upper surface. *websteri.*
c2. Tomentose shrub, with white branches. Leaves pinnatifid. Heads twice as long as broad. *leucostachys.*
A6. Various.
b. Involucral scales 1-seriate, with membranous, sublacerous margins, shorter than the flowers.
c. Branching from the base. *laseguei.*
c2. Prostrate, branching, tomentose. Leaves oblong, linear, sessile, entire. *exilis.*
b2. Heads 1–8 on the branches, radiate, smooth, calyculate, leaves linear-filiform. *mendocinus.*
b3. Large cottony leaves: odor of celery. Rest unknown. *candicans.*

1. Senecio acanthifolius Homb. & Jacq.

Corymbose. Erect, glabrous or pubescent herbs. *Stem* hollow, simple, sulcate. Lower *leaves* long-petioled, oblong-ovate, basicordate, margins lobed, the lobes coarsely crenate; petioles winged, sheathing at base. Upper leaves sessile, semi-amplexicaul. Heads radiate. *Involucre* broad, its scales 1-seriate.

Magellan and Fuegia, to Cape Horn, passim. Handsome and abundant in the woods and by streams, "in steppe-regions and forest-regions of mean moisture."

2. Senecio albicaulis Hook. & Arn.

Compound *corymb*. Hoary tomentose shrub, at length naked; with white, smooth branches. *Leaves* linear, obtuse, somewhat fleshy, their margins entire or rarely pinnatifid. *Involucre* cylindric to campanulate, shorter than the flowers; its scales about 14, linear-acute, subsphacelate at the apex.

N. Patagon., by Rio Negro.

3. S. alboffianus (Alboff sine nomine).

Near *S. miser* Hook. *Heads* solitary on branches. Rhizome long-fibrillose, branching, bearing many stems. *Stems* low, 8–10 cm., naked and scarred at the base, densely leafy and branching upwards, the branches ending in a 10–15 mm. peduncle and head. *Leaves* linear-spatulate, attenuate-petiolate, entire or toothed near apex; the upper webby to tomentose. *Heads* small, campanulate. *Involucral* scales linear, their margin broad scarious. Flowers?

Fuegia, Ushuaia.

4. S. allœophyllus O. Hoffmann.

Branches 1-headed. Undershrub, with smooth, leafy branches. Lower *leaves* linear or narrow-spatulate, entire; upper leaves obovate, broad-cuneate, sessile, 3-lobed at apex, margin revolute, webby at least on under surface. *Heads* on short, terminal peduncles, with a few linear, acute bracts, homogamous. *Involucral* scales oblong, webby at base. Style-branches long, truncate. *Achenes* glabrous. *Pappus* snow-white. (Fig. 98.)

Fig. 98.

Senecio allœophyllus.— Leafy stem and flower-head (after O. Hoffman).

S. Fuegia, on mountains. (O. Nordenskjöld.)

5. S. andersoni Hook. f.

Heads few. *Stem* ascending, laxly woolly. *Leaves* suberect or spreading, linear-oblong or linear-lanceolate, subflaccid, acute or acuminate, entire or apically lobed; margins recurved, woolly. *Heads* rather large, long- and slender-pediceled. *Involucre* broad, its scales linear, arachnoid or smooth, shorter than the disk.

Near *S. patagonicus*.

Magellan, E. and W. Fuegia, and S. Fuegia, by Rio Olivaia.

Var. (1) With the lower leaves broader and lobed.
(2) With leaves linear, entire.
(3) A more woolly form at Ushuaia.
(4) A white-woolly 1-headed form at Ushuaia.

6. Senecio argenteus G. Kze.

Branches 1-headed, appressed, sub-tomentose, striate. *Stem* ascending from a woody base. *Leaves* linear, entire, obtuse, the upper fewer and acute. *Involucre* campanulate, scarcely bracteolate, its scales about 20, acute, subustulate. Ligules 25 mm., linear-oblong. *Achenes* hirt-pubescent.

(Chili, on rocky parts); Patagon. (Moreno).

7. S. arnotti Hook. f.

Corymbose, discoid. Erect undershrub, glabrous or obscurely glandular-hairy. Branches erect, leafy, simple. *Leaves* solitary or subfasciculate, coriaceous, broad-linear or oblong-linear-lanceolate, acute, entire, margins revolute, rib underneath puberulous. *Heads* 4–12, broad, with long pedicels and subulate, bracteate leaflets. Involucral scales narrowly linear-lanceolate, acuminate. *Achenes* hispid-puberulous.

Magellan; Fuegia, at Orange Harbor (specimen in Gray Herb.); S. Patagon., by J. B. Hatcher.

S. arnotti dentatus.

With coarsely toothed leaves.

8. S. auriculatus Alboff.

Corymbose. Tall, to 1–2 m., glabrous, with fistular *stem*, ending in the lax, about 10-headed inflorescence. *Leaves* large, membranaceous; the lower long-petioled; the upper sessile, amplexicaul; broad, oblong-obtuse, subcordate at base, pinnately lobed, the lobes rounded and lobulate, and their sublobes crenate-dentate; the uppermost leaves lance-oblong, acutely toothed. *Petioles* with 2–4 small, amplexicaul lobes; the upper leaves only with large auricles. *Peduncles* rather long. *Heads* mid-sized. *Involucral* scales few, linear, acute. Ray-flowers white.

S. Fuegia, in Navarin I., beautiful.

9. SENECIO BEAUFILSII O. Ktze.

Head solitary, discoid. Small shrub, 50 cm., erect, branching, tomentose in youth, leafy below, rather naked upwards. *Leaves* sessile, linear, entire or rarely 2-toothed, obtuse, margin reflexed. *Involucre* shorter than the disk, 15 mm., campanulate, scales 1-seriate, 12, equal, lanceolate, glabrescent. Bracteoles 2–3, small. *Achenes* glabrous.

S. Patagon., Sta. Cruz ("may be *S. sericeus neæi* with single head." O. Ktze.)

S. BEAUFILSII TONINII O. Ktze.

With very many paucidentate leaves.

Patagon.

10. S. BRACTEOLATUS Hook. & Arn.

Heads many, corymbose, crowded, longer than broad, each 12 mm. in diameter. Glabrous shrub, with linear, acute leaves, 25 mm. long, entire. *Pedicels* with numerous bracteoles, which are small, subulate, with white, glandulous tip. *Involucre* ovoid, attenuate, calyculate; its scales about 10, lanceolate, acute, subsphacelate, not as long as the corollas. *Achenes* glabrous.

S. Patagon., by RR. Gallegos and Sta. Cruz.

FIG. 99.

Senecio candidans.—Leaf: flower-head and one of the flowers. (From *Flora antarctica.*)

11. S. CANDICANS DC (non Wall.).

Tall, with odor of celery. *Leaves* large, white, cottony.

Magellan, Bay Ste. Marie (by Heriot, May 7, 1883, only the leaves). Fuegia, in maritime dunes.

12. S. CANDIDANS (Vahl) DC.

Corymbose umbel, discoid heads. Erect, simple, woolly herb, with radical and inferior *leaves*, broadly petiolate, ovate, crenate, the upper leaves sessile, elliptic-oblong, entire. *Heads* 7–8; on *long, woolly peduncles, 1-headed.* *Involucral* scales rather shorter than the disk, narrow, apically glabrate. (Fig. 99.)

Magellan ; Fuegia, passim ; S. Patagon., by Lago Argentino and Rio Gallegos ; Falklands. "Abounds in sandy beaches, chiefly in the eastern parts."

A specimen in the Gray Herbarium has leaves very broad and woolly, the lower leaves subcordate, 12 cm. broad, on a 17 cm. petiole.

13. SENECIO CANDOLLEANUS (Hook. & Arn.) O. Ktze.

Corymbed. Shrub white-tomentose, velvety. *Leaves* with flat petiole, broadly ovate in outline, deeply pinnatifid, the segments 6–7, broadly linear, patent, acutish, slender-costate. *Heads* few. *Involucres* broad, densely woolly ; the scales about 18, obtuse, shorter than the corolla.

(Argentina) ; coast of Patagon. "Leaves like a coarse *Artemisia*" ; occasionally with some entire.

14. S. CARICIFOLIUS (Hook. & Arn.).

Compact *corymb. Shrubby*, white, tomentose at first, less crowded near the flowers, becoming glabrous. *Branches* fasciculate, long. *Leaves* linear-subulate, acute, entire, margin revolute. *Involucre* brown, cylindraceous, calyculate, its scales 10–12, narrow-linear, shining.

(Bahia Blanca) ; N. Patagon. ; S. Patagon., by RR. Gallegos and Sta. Cruz.

15. S. CERATOPHYLLUS D. Don.

Heads solitary on few-leaved, angulate branches. *Undershrubs* webby, with deciduous wool. *Leaves* linear-spatulate, mucronate, plane, 3-toothed at apex, or the uppermost entire. *Involucre* campanulate, its scales subulate, few-bracteolate, not apically sphacelate. *Ligules* about 14, broad-linear.

(Chili ; Brazil); Patagon., Magellan.

A var. with larger branches and leaves, the uppermost leaves entire.

16. S. CHILENSIS Less. (*S. ceratophylloides* Gris.)

Heads terminal, solitary, erect. Much branching and ascending. White-tomentose. *Leaves* sessile, linear-entire. *Involucre* campanulate ; its scales 1-seriate, narrowly linear, acuminate, non-sphacelate. *Ligules* 4-nerved, 3-toothed.

(N. Patagon., "Leaves rather larger than in Grisebach's description, to 68 mm."); S. and W. Patagon., in Valley of Rio Aysen (Dusén).

17. Senecio chrysocomoides Hook. & Arn.

Corymb of 2–5 heads. Glabrous *shrubs*, 20 cm. high, with fascicled branches. *Leaves* linear, straight, deeply pinnatifid, their segments few (2–4), narrow-linear, short, straight. *Heads* 6 mm. in diameter. *Involucre* ovate, basiacute, long-calyculate, its scales about 10, lax, subulate, shorter than the corollas.

Patagon., on east coast.

18. S. ctenophyllus Phil.

Corymb lax. Glaucous-glabrous *shrubs*, with pectinate *leaves*, the lobes of the lower leaves toothed. *Peduncles* capillary, as long as the bracteolate, tomentose *heads*. *Involucral* scales 10–12, apically sphacelate. *Ligules* about 6. *Achenes* silvery puberulous.

Remarkable for the pectinate form of its leaves and for its tomentose heads.

(Chili, Desert of Atacama); Patagon.

19. S. cuneatus Hook. f.

Corymb 3-headed, with few leaves. Glabrous herb, with ascending, sulcate stem, leafy below. Most of the *leaves* on short branches, obovate-spatulate, basicuneate, attenuate-petiolate, coarsely and irregularly toothed, subcoriaceous. *Heads* radiate, their pedicels 1-leaved at base. *Involucre* broad, its scales 1-seriate, linear.

Magellan.

20. S. danyausii Homb. & Jacq.

Corymbed. Slender undershrub, branching at the base, laxly woolly. *Leaves* fascicled, linear or linear-oblong, subacute, entire or coarsely toothed, margins revolute, woolly especially underneath. *Heads* small, campanulate, constricted in the middle. *Involucral* scales linear-subacute, webby, shorter than the disk.

"Distinguished from *S. micropifolius* DC. by its leaves being often linear-cuneiform, trilobed at apex." (Franchet.)

Magellan; by Hatcher in S. Patagon.; W. Patagon., near Rio Aysen (Dusén); in valley of Rio Gallegos; in Fuegia, at Ushuaia, and passim, as a steppe plant, and the commonest species of this genus.

Var. (1) with leaves entire and larger heads; (2) with leaves toothed and smaller heads.

SENECIO DANYAUSII LOBATIFOLIUS Homb. & Jacq.

Leaves serrate or pinnatifid.

E. Fuegia (Dusén).

S. DANYAUSII PINNATIFIDUS Macl., n. var.

Very like *S. danyausii lobatifolius*, except that the *leaves* are somewhat more deeply serrate or pinnatifid. (Determined by Dr. O. Hoffmann.)

By Hatcher at Rio Sta. Cruz, S. Patagon., Jan., 1897.

21. S. DARWINII Hook. & Arn.

Heads radiate. Low, prostrate shrubs, much branching. *Leaves* woolly, much as in *S. falklandicus*, but generally cuneate and trifid or trilobate or repand-dentate. *Peduncles* long, or heads sessile among the upper leaves.

Magellan, Fuegia.

S. DARWINII ERADIATUS Gray.

Low, condensed, leaves small. *Ligules* none.

Fuegia, at Orange Harbor.

22. S. DELFINI Phil.

Corymb lax, many-headed. Tall, glabrous herb, with simple, fistulous stem. *Leaves* pinnatifid, to 9 pairs, the segments narrow-linear. Lower *peduncles* very long, naked or 1-leaved, 3–5 headed, with bracteolate pedicels. *Heads* 6 mm. in diameter, non-calyculate; *involucral* scales 10. *Achenes* white silky.

Valley of Rio Palena, west of the Cordillera.

23. S. DESIDERATUS DC.

Subcorymbose, few-headed. Glabrous undershrub, with terete branches and sessile, pinnatipartite *leaves*, having linear rachis, and 6–8 pairs of segments, these acute and undivided or bipartite to their base; the uppermost linear, entire. Floriferous branches bracteate. *Involucre* ovate, calyculate, its scales about 10, acute, non-sphacelate. *Ligules* 10, many-nerved; disk-flowers 25–30. *Achenes* slightly hairy.

S. Patagon., by Puerto Deseado; Magellan, Golfo de San Jorge.

24. Senecio doeringii Hier.

Compound, terminal *corymb*, of 20–27 homogamous, yellow, rayless heads. *Shrub* silky, with appressed tomentum. Leafy, terete branches 25 cm. long. *Leaves* sessile, 3 cm. long, 1 mm. broad, acutish or obtusish, linear, thick, entire, margins revolute, midrib prominent underneath, canaliculate above. *Involucre* cylindro-campanulate, with small bracteoles; its scales 13, linear, dorsally subarachnoid, basally subconnate, apically sphacelate. *Achenes* papillose-villous. *Pappus-setæ* white above, barbellate.

Patagon., by Rio Negro, Golfo de San Jorge and Rio Sta. Cruz.

25. S. dumosus Phil.

Corymbs 3-headed, discoid. Glandular-puberulous undershrubs. *Branches* crowded, erect, densely leafy upwards. *Leaves* subsphacelate, the upper half incised-toothed, with 3–5 teeth on each side. *Involucral* scales 20, glabrous, green, pale-margined. *Achenes* glabrous.

East Fuegia.

26. S. dusenii O. Hoffm., n. sp.[1] (Plate XXX, B.)

Heads radiate, midsized, about 4 on ends of branches. Sparsely branching, finely villosulous undershrub, stem rooting at base and ascending, densely leafy below and sparingly above. *Leaves* obovate or oblanceolate, sessile but with petioliform base; lamina pinnately 3–7-lobed or with callous-tipped teeth, glabrous. Upper leaves passing into the shortly ciliate bracts of the pedicels and calyculus. *Involucre* campanulate, its scales about 15, linear, acuminate, green, marginate, with an obscure nerve, or occasionally 2-nerved, the apex puberulous, equalling the disk.

[1] Senecio dusenii O. Hoffm., n. sp.

Suffruticosa caule basi radicante adscendente parce ramoso, inferne dense superne laxe foliato, ad partes juniores minute villosulo more glabrato; foliis obovatis vel oblanceolatis basi sensim in partem petioli-formem sessilem glaberrimam vel margine pilis paucis septatis minutissimis munitam angustatis, lamina propria glaberrima pinnatim 3–7-lobata vel dentata, dentibus obtusis apice calloso-punctatis; foliis superioribus paulatim in bracteas lineares acutas pedicellorum et calyculi transeuntibus; capitulis mediocribus radiatis ad apices ramosum pauces (circiter 4) fastigiatis, pedicellatis, pedicellis minute villosulis bracteatis, bracteis sicut squamis calyculi margine pilis brevibus paucis ciliatis; involucri campanulati squamis circiter 15 linearibus acuminatis viridibus marginatis, nervo obscuriore (vitta oleifera) vel hinc inde nervis 2 percussis apice minute puberulis disco æquilongis; ligulis involucrum duplo superantibus linearí-oblongis; styli ramis truncatis; ovariis glabris; pappo albo.

Ligules twice as long, linear-oblong. *Style-branches* truncate. *Achenes* glabrous. *Pappus* white.

The described branch is 24 cm. high. Lower leaves somewhat crowded, about 25 mm. long, 12 mm. broad; the upper leaves gradually smaller. Heads 4 at apex of the branch, but in one strict lateral branch 3. Pedicels 4–8 cm. long. Involucre 1 cm. high and slightly narrower. Corollas of ray with a slender tube, 5 mm. long; ligules 12 mm. long, 3 mm. broad, tridentate, 4-lineate, closely resembling *S. otæguianus* Phil., but differing by its broader leaves, bracted pedicels and by having a calyculus.

W. Patagon., by Rio Aysen. Coll. Dusén, Jan. 8, 1897 (n. 472).

27. S. EIGHTSII Hook. & Arn.

Heads radiate. Close to *S. darwinii*, but with smaller, narrower, deeply trifid *leaves*, their segments varying in breadth, sometimes linear. *Heads* smaller.

Magellan; Fuegia; Staaten I.

Var. with *procumbent* stem, lax, leafy, ascending branches, leaves 3–5-cleft, and heads shortly peduncled.

28. S. EXILIS Homb. and Jacq.

Stem prostrate, the branches ascending, cylindric, tomentose. *Leaves* oblong-linear, acute, sessile, entire, apically revolute-margined, both sides tomentose. *Involucral* scales 1-seriate, oblong, acute, sublacerous, with membranaceous margin, half as long as the flowers. *Achenes* glabrous.

Magellan; E. Fuegia, Dusén.

FIG. 100.

Senecio falklandicus. —Leafy branch and flower-head; also a disk-flower and a ray-flower. (From *Flora antarctica.*)

29. S. FALKLANDICUS Hook. f. (*S. littoralis lanatus* Gaud.)

Heads radiate, subsolitary. *Shrub*, with branches, peduncles and under surface of leaves densely woolly. *Leaves* linear-oblong to obovate-spatulate or lanceolate, entire or toothed, ending with an apical subacute callus, the margins revolute. *Heads* large, near 4 cm. across, most of them pedunculate, the peduncles

bracted. *Involucre* broad, its scales about 3-seriate, linear, woolly at the base. (Fig. 100.)

"Allied to *S. patagonicus*." (J. D. Hooker.) (See *S. littoralis*.)

Falklands, abundant; Magellan (Dusén).

30. SENECIO FALKLANDICUS PINNATIFIDUS O. Hoffm.

Leaves broad-lanceolate, the lower pinnatifid in the upper third part, the segments broad or narrow, obtuse or acute, entire or 1-toothed, different from the type.

Punta Arenas, Dusén.

31. S. FASCICULATUS Hook. & Arn.

Head solitary, terminal. Subdichotomously branching shrub, white tomentose. *Leaves* remote, linear, obtuse, fleshy, with revolute margins; their axils bearing leaf-fascicles or short, leafy branches. *Involucre* noncalyculate; its scales 18, subulate, their apex subsphacelate. *Achenes* long, glabrous, equalling the pappus.

(Chili); S. Patagon., Gregory Bay; by RR. Gallegos and Sta. Cruz.

32. S. FISTULOSUS Poepp.

Corymbose, radiate, glabrous perennial, 35 cm. high, with vertical, fistular rhizome. Two lower *leaves* petiolate, oblong, petiole and lamina each 10 cm. long, attenuate both ways, finely toothed. Upper leaves few, smaller, lanceolate, amplexicaul, slightly webby at base. *Pedicels* nearly naked. *Involucre* campanulate, its scales 20, shorter than the disk. Heads rather large, with 10 oblong ligules and 40 disk-flowers. *Achenes* glabrous.

S. Patagon., by Hatcher at head of Rio Chico de la Sta. Cruz, Feb. 9, "white."

33. S. FLACCIDUS Homb. & Jacq.

Heads rather large, 1 or few-corymbed. Many-stemmed undershrub, lax-woolly, erect, simple or nearly so. *Leaves* linear-oblong, obtuse. *Involucral* scales few at base, linear-oblong, acuminate, lacerate-fimbriate, shorter than the disk.

Magellan.

34. SENECIO GILLESIANUS Hieron. (*S. gilliesii* Phil. non H. & A.)

Patagon.; "differs from Phillipi's specimens by heads being slightly larger; *achenes* not densely hispid, but white-pubescent; *leaves* in some parts 72 mm. long, and lobules reaching 28 mm."

Var. *a*, *arachnoides* Hier. Leaves and branches webby. N. Patagon., by mouth of Rio Negro and the coast.

Var. *b*, *glaberrima* Hier. About Rio Negro.

35. S. GILLIESII Hook. & Arn.

Heads large. *Stem* few-leaved, scape-like, 1–2-headed. Hoary, with deciduous wool. Radical leaves oval-oblong, thick, fleshy, entire or toothed, attenuate to a long petiole. Cauline leaves sessile, the upper linear. *Involucre* broad-campanulate, calyculate, its scales about 30, linear-lanceolate, scarcely sphacelate. (See *S. sericeus* O. Ktze.)

(Argentina, Cordilleras); Patagon.

36. S. GLABER Less.

Corymbed, radiate. Herbaceous (?), glabrous. *Stem* terete, scarcely striate. *Leaves* sessile, pinnately parted; lobes 7–8 pairs, linear, acute, some lobulate. *Pedicels* generally shorter than the heads, minutely bracteolate above. Involucral scales 10–12, acuminate, not sphacelate. Ligules about 8, 3–4-nerved; disk-flowers 20–25. *Achenes* puberulous. *Heads* much more numerous and smaller than in *S. pinnatus*.

(S. Chili); Patagon., in high places by Rio Chubut; "herbaceo-fruticose fistulous; margins of leaves subrevolute, only thus in dry specimens (?)." (Speg.)

37. S. HATCHERIANUS O. Hoffm., n. s.[1] (Plate XXX, A.)

Undershrubs with *solitary*, *discoid heads* on strict branches which are densely leafy below and naked upwards. *Leaves* small, linear, sessile,

[1] SENECIO HATCHERIANUS O. Hoffm., n. s.

Fruticulus ramosus, ramis glabris strictis in parte inferiore dense foliosis, superne pedunculoideis, squamis paucis bracteatis, monocephalis; foliis parvis linearibus sessilibus obtusis, margine revolutis, integerrimis vel rarius sub apice in utroque latere unidentatis, undique glandulis minutis sessilibus dense obsitis, capitulis mediocribus, homogamis, circiter 50-floris; receptaculo convexo, involucri parce calyculati late campanulati squamis 15, more foliorum glandulosis, linearibus, breviter acuminatis, tenuiter paucinervatis, summo apice minute velutinis et sphacelatis; floribus omnibus ♀ breviter exsertis; corollis luteis in limbum 5-dentatum sensim ampliatis; styli ramis truncatis; ovario glabro; pappo albido.

obtuse, marginally revolute, entire or nearly so, covered on both surfaces with dense, sessile glands. *Heads* mediocre, with about 60 hermaphrodite flowers. *Involucre* sparsely calyculate, broad, the scales 15, glandular, linear, shortly acuminate, apically sphacelate. *Corollas* yellow, gradually enlarging, 5-toothed. *Style-branches* truncate; *ovary* glabrous; *pappus* whitish.

Cordilleras of Patagon., J. B. Hatcher, 1897.

Shrub of 25 cm., somewhat rough below, from the scars of the fallen leaves. Leaves ranging up to 2 cm. by 2 mm. Upper leafless part of the branches 4 cm. long, with a few narrow bracts of 3 mm. passing into the bracts of the calyculus. Involucre 8 mm. high, 12 mm. broad. Corolla 6 mm.

Similar to *S. gilvus* Phil. and *S. trifidus* H. A., but distinguished by the glandular pubescence and the form of the involucral bracts.

Type specimens, with Prof. O. Hoffmann, and no. 145 of *Plantæ Hatcherianæ* in Princeton University, U. S. A.

38. Senecio hauthalii O. Ktze.

Heads discoid, 1–3, subsessile. Low shrub, with its lower branches covered by persisting petioles, otherwise glabrous. *Leaves* fleshy, pectinate, petiolate, the petiole-base amplexicaul, 3 cm. long, the basal lobes spinose. *Involucral* scales 1-seriate, subequal, 15–20, oblong, acuminate, fimbriate, with small, calyculate bracts, as long as the disk. *Achenes* short, pappillose. *Pappus* white.

Patagon.

39. S. hirthi Phil.

Heads few, on virgate branches, naked above. Glabrous undershrubs, with oblong-cuneate *leaves*, 3–5-toothed near top, crowded at base, shorter upwards. *Involucral* scales not apically sphacelate. *Achenes* glabrous.

At Rio Palena, west of the Cordilleras; S. Patagon., on the Cordilleras, Hatcher.

40. S. hualtata Bert.

Crowded *corymbs;* heads radiate. Herbaceous, glabrous; apically webby in parts when young. *Stem* terete, striatulous, leafy. Lower *leaves* petiolate, rhombo-hastate, acuminate both ways, unequally dentate, upper leaves semiamplexicaul, lanceolate, dentate. *Pedicels* mostly shorter

than the heads, bracteolate. *Involucre* of about 20 scales, bracteolate, not ustulate, subcalyculate. Ligules 8–12, linear-oblong; disk-flowers 50–60. *Achenes* glabrous.

(Chili); Chubut, in præandine swamps.

41. SENECIO HYADESII Franchet.

Dense, terminal *corymbs* of yellow, discoid heads. *Plant* webby-tomentose, tall, with virgate, leafy branches. *Leaves* oblong, attenuate-petiolate, scarcely acute, margins revolute, the lower obscurely toothed. *Involucral* scales acute, woolly, except the apex. *Achenes* glabrous.

Magellan, Banner Bay.

42. S. HYPSOPHILUS Phil.

Heads radiate, solitary on the ends of the many branches, which are apically leafless, with long bracts. Glabrous undershrub; *leaves* long-petiolate, subspatulate, 5-cleft at top, rarely 3-cleft. *Involucre-scales* about 16, very acuminate; ligules as many, twice as long, scarlet. *Achenes* very striate, glabrous. Head about 25 mm. in diameter.

(Chili); Patagon. (?).

43. S. IBARI Phil.

Corymbed, 3–7 heads. Glabrous undershrub, branching at base, leafy throughout. *Leaves* crowded, linear, attenuate below, acute, entire, or with 1–2 teeth. *Pedicels* equalling the heads, with crowded, setaceous bracts. *Involucral* scales 15–20, glabrous, margin scarious, with gladular-ciliate apices. *Achenes* glabrous.

Magellan, Skyring Water, and Bahia de Gente.

44. S. INCISUS DC. (*S. neæi lobulatus* H. & A.). (See *S. neæi incisus* DC.)

Leaves subglabrescent, pinnately lobed, with 1–4 short teeth or segments, 5–10 mm. long.

(Argentina); Patagon.

45. S. KINGII Hook. f.

Scape 1-headed, *head* discoid. Glabrous herb, with simple, short, leafy, decumbent stem. *Leaves* petiolate, fascicled at the apex of stem, fleshy, linear-spatulate, coarsely toothed. *Scape* solitary, erect, with 2–3 subu-

late leaves, puberulous above. *Involucre* broad, its scales glabrous, linear-lanceolate, its tips sphacelate, shorter than the disk.

Patagon., valley of Rio Gallegos (Nordenskj.); Lagos; in Cordilleras of S. Patagon. (by Hatcher, Feb. 16, 1897); of the steppe-flora, growing in the driest places; Magellan; Fuegia.

46. Senecio kurtzii Alboff. (non Phil.).

Heads solitary, large. Plant fleshy, glabrous, with creeping rhizome, sending up sterile shoots, and low, striate, leafless scapes, with setaceous bracts. *Leaves* spatulate, attenuate to long petioles, apically short-toothed. *Involucral* scales linear. *Flowers* dimorphous; of disk tubular, of ray fewer, female, filiform, obliquely truncate, with long style.

Fuegia, at Ushuaia; by Hatcher on Cordilleras of Patagon.

47. S. lævicaulis DC.

Corymbose, discoid, glabrous. *Undershrub*, with terete, slender, flexuose, branching stem. Cauline *leaves* sessile, minutely auricled-cordate, elliptic-oblong, acute, with some teeth. Bractlets 3–5, ovate, ciliolate under the involucre; scales 10, equalling the disk, or longer, ciliolate-floccose at the apex. Disk-flowers 20, tubular.

(Chilian Andes.) Patagon., by Golfo de San Jorge.

48. S. laricifolius H. B. & K.

Heads radiate, solitary, long-pedunculate. A small, branching *shrub*. *Leaves* dense, narrow-linear, subacerose, plane, entire, glabrous, spreading, 25 mm. long. *Involucre* campanulate, calyculate. *Achene* hispid. *Pappus* white, equalling the corolla.

(Peru); N. Patagon., plateaux.

49. S. laseguei Homb. & Jacq.

Stems branching from the base, rooting, the branches ascending, glabrous, entire or remotely toothed at the apex. *Involucral* scales 1-seriate, oblong-linear, acute, sublacerous at the membranous margin, exceeding the flowers. *Achenes* glabrous.

Magellan, Port Peckett; Punta Anegada.

50. SENECIO LECHLERI Phil.

Heads discoid, 3–5 on the branches. Undershrubs, with erect, virgate, white-woolly branches. *Leaves* very green, rather glabrous on the upper surface, webby underneath, erect, *linear*, entire, acute, fleshy. Pedicels rather long, bracted, white-woolly. *Involucral* scales calyculate, apically very green and pencillate. All the flowers tubular, white, slightly longer than the involucres.

Magellan, near Punta Arenas.

51. S. LEUCOMALLUS A. Gray.

Heads 1–3, discoid, midsized, pediceled, on leafy branches. *Shrub* white, woolly, 30 cm. high. *Leaves* spatulate, entire, obtuse. *Involucre* woolly, with bracteoles equalling its scales. *Achenes* glabrous. (Leaves as of *Leontopodium*.)

Magellan; Fuegia, to Orange Harbor, near Cape Horn.

52. S. LEUCOSTACHYS Baker. (*S. albicaulis pinnatifidus* H. & A.)

Compound *corymbs*, heads twice as long as broad. *Shrub* hoary-tomentose, at length naked. Branches white, smooth. *Leaves* pinnatifid, their segments linear-elongate. *Involucre* oblong, its scales about 12, shorter than the corollas, 28 mm. long, acute, subsphacelate at apex.

Patagon., near Los Lamos.

53. S. LIMBARDIOIDES Hook. & Arn.

Many-headed *corymb*. Scabrous *shrub*, with strict, striate branches, subdensely leafy. *Leaves* broad-linear, subspatulate, acute, plane, entire, with a distinct rib underneath. *Pedicels* with subulate bracteoles and broad, calyculate *involucre*, its scales 16, linear-subulate, not sphacelate, shorter than the corollas.

Magellan, at Port Gregory.

S. LIMBARDIOIDES MAJOR.

Leaves and *heads* a little longer than the pedicels. *Involucral* scales numerous.

Magellan, Port Famine.

54. Senecio linariæfolius Poepp.

Few-headed *corymb.* Glabrous, with terete branches. *Leaves* linear, basally attenuate; the apex with a callous point, entire, 25 by 3 mm. *Pedicels* of corymb long, bracteolate. *Involucre* 10–12-leaved, calyculate, its scales black-tipped and floccose. Ligules about 12, linear; disk-flowers 20. *Achenes* glabrous.

"Patagonian specimens have the involucral scales not black-tipped, but white-pencillate, leaves much shorter, and stems 1-headed and 3–5-headed." (Speg.)

(Mountains of S. Chili); Patagon., Chubut, swamp-meadows, by Lago Fontana.

55. S. littoralis (Gaud.). (*S. vaginatus* H. & A.)

Large, radiate *heads*, solitary on leafy branches. Erect, terete, glabrous stem. *Leaves* sessile, linear to obovate-lanceolate, mostly acute, entire, coriaceous. *Involucre* calyculate, its scales about 20, linear-lanceolate, as long as the disk. Ligules 10–12. The leaves may be straight or falcate, acute or obtuse, 2–8 mm. broad; *heads* 35 mm. in diameter; 100 of the heads opening at once in a small plant render it handsome.

Falklands, abundant in marshy places. (Its var. *a* of DC. Prodr. is *S. falklandicus* Hook. f.)

56. S. longipes Hook. f.

Corymbs with 3–7 broad, discoid *heads*, on very long pedicels, with subulate-filiform bracteoles. Glabrous or glandular, pubescent upwards, with simple, erect branches. *Leaves* fasciculate, narrow-linear or filiform, acute, basally attenuate, apically serrate, marginally revolute. Involucral scales 1-seriate, glandulous, shorter than the disk.

Fuegia, at Ushuaia; S. Patagon., by Hatcher. Magellan.

(*S. magellanicus* H. & A., sub *Culcitium.*)

57. S. magellanensis (Phil.) Macl. (*S. magellanicus* Phil. (non H. & A.).

Heads solitary, discoid. Low perennial, with many *stems*, at length glabrous; stems simple, slender. *Leaves* linear, attenuate both ways, entire or toothed; when young snowy-tomentose; upper leaves few, setaceous. *Involucral* scales about 12, green, glabrous. *Achenes* glabrous.

E. Fuegia.

58. SENECIO MENDOCINUS Phil.

Heads radiate, 1–8 on branches naked above, on rather long peduncles. *Glabrous* shrub with fleshy, linear-filiform *leaves*, acute, crowded, and peduncles few-bracteate, *involucre* calyculate, with about 13 scales, marginally scarious, not apically sphacelate. Ligules 8–10. *Achenes* very shortly hispid.

N. Patagon., by Rio Negro.

59. S. MICROCEPHALUS DC. (*S. patagonicus* H. & A.)

Corymbose, 5–7-headed, heads discoid. Tomentose *shrub*. *Leaves* rigid, suberect, linear-oblong or oblong-lanceolate, subacute, entire, medially canaliculate above, margin revolute. *Pedicels* long. *Involucre* broad, calyculate, its scales linear-oblong, subacute to acuminate, shorter than the corollas.

(Chili); Magellan, at Port Famine; Fuegia, by Beagle Channel.

S. MICROCEPHALUS ACLONETUS (Ph.) O. Ktze.

A radiate form, its young not branched.

60. S. MICROCEPHALUS HOOKERI (Homb. & Jacq.) (sub *S. patagonicus*).

Stems low, 12–14 cm., much branching, densely leafy. Leaves fasciculate, lance-linear, basiattenuate, apically few-toothed, margin revolute. Peduncles thick, short. (Alboff.)

Fuegia.

61. S. MICROPIFOLIUS DC.

Heads 1–8, discoid, midsized, in terminal, bracteolate corymbs. Tomentose perennial, 30 cm. high, with erect, leafy branches; base of stem woody, leafless. Leaves sessile, oblong, with revolute margin, entire, ending in a dark point. Branches leafy to the top. Involucre "ovate," its scales about 15, woolly, but apically sphacelate, slightly shorter than the disk. Disk-flowers 30. Achenes glabrous.

(S. Amer.; Cordilleras of Chili); S. Patagon., by Hatcher at Cabo Negro and Coy Inlet, Dec. 20; Fuegia.

(The involucre is not ovate but campanulate and calyculate, with a few minute bracteoles. Leaves 2 cm. long. Otherwise it agrees with the description of DC. Prodr., vi, 413.)

62. Senecio miser Hook. f.

Heads 1–2, *discoid*, broad. Depressed, hairy-viscous *undershrubs*, with branching, scarred, ascending stem; branches short, leafy. *Leaves* many, small, coriaceous, rather crisp, narrowly linear-spatulate, irregularly sinuate-dentate or subpinnatifid; margins reflexed. *Pedicels* short. Involucral scales narrow-lanceolate, slightly shorter than the disk.

Magellan; Ushuaia, by Alboff (a larger form, 16–18 cm., stems naked below). From Rio Sta. Cruz, with the lobed leaves not viscous, and with larger, long-pediceled heads. (Speg.)

63. S. miser tehuelches Speg.

Branches 1-headed, with 3–6 linear, acute bractlets. Lowly cespitose, with narrow-linear *leaves*, glabrous below, having two lobes on each side; the upper leaves smaller. *Involucre* 1-seriate, of 13 scales, slightly adhering. *Flowers* in a head, 25–30, all tubular, slightly exceeding the involucre.

S. Patagon., by Rio Deseado.

64. S. morenonis O. Ktze.

Heads radiate, solitary, on nearly leafless peduncles. Low (15 cm.) silky-tomentose *undershrub*. *Leaves* crowded at the base of the branches, linear, acute, 4 cm. by 1 mm. *Involucral* scales about 20, linear acuminate. *Heads* turbinate or cylindrical. (Near *S argenteus* G. K.)

Patagon.

65. S. neæi DC. (See *S. sericeus* O. Ktze.)

Corymb simple, 7–8-headed, pedicels naked, as long as the discoid head. Shrub-like, branches terete, canescent. *Leaves* linear, entire, acutish, becoming glabrous. *Involucre* 12–13-leaved, shorter than the disk.

Flowers about 20. *Achenes* terete, glabrous.

(Argentina; Chili); Patagon.

S. neæi incisus DC.

Leaves with 1–2 teeth on each side, or lobes, about midway.

S. Patagon., near Puerto Deseado, and Sacramento Colony.

66. S. nordenskjöldii O. Hoffmann.

Heads 1–few, terminal, small, *discoid*. Low, branching *shrub*, 20 cm. high, glabrous, but the young branches and leaves finely glandular-pubes-

cent; leaf-scars on base of branches. *Leaves* sessile in outline, narrowly linear to oblanceolate, acute, entire, or mostly 3-(5-) pinnately parted next their apex. *Peduncles* with several short, acute bracts. *Involucre* campanulate, its scales 20, linear-oblong, acute, white margined, with an oily vitta. Flowers perfect, their tubular corollas yellow, enlarged upwards. *Style-branches* truncate. *Achenes* glabrous. *Pappus* white.

(S. Patagon., by O. Nordenskjöld in valley of Rio Gallegos); E. Fuegia (Dusén). "Yellow in bloom, all along the Andes, abundant" (Hatcher).

SENECIO NORDENSKJÖLDII SIMPLICIOR O. Hoffm.

Lower than the type, with some *leaves* 3-toothed, but most entire.

E. Fuegia, by the sea-coast (Dusén).

67. S. OTITES G. Kuntze.

Corymb large, compound. *Heads* nearly discoid. Glabrous herbs, with terete, striate, branching stem. *Leaves* with a broad, rounded, toothed auricle at base of the petiole, lamina broad-lanceolate, dentate, basally cordate or truncate. *Pedicels* sparsely bracteolate upwards. *Involucre* with 8–9 scales, not ustulate. Ligules 5, oval-oblong. Disk-flowers 15–20. *Achenes* glabrous.

(S. Chili); W. Patagon.

68. S. PACHYPHYLLUS Remy (non Cheesem.).

Heads 1–few on branches nearly naked above. Glabrous *shrubs*, with stem branching and rooting, branches leafy at the middle. *Leaves* sessile, oblong-linear, coarsely subcylindrical, entire, acute. *Peduncles* few-bracted. Involucre subcalyculate, ovoid-campanulate, its scales oblong-linear, scarious-margined, shorter than the disk. *Achenes* glabrous, costate.

(Talcaragua); S. Patagon., in Cordilleras, by Hatcher. A specimen in the Gray Herbarium, bears a note "Leaves slightly broader and heads larger"; the same is true of the Hatcher specimen. Professor O. Hoffmann confirms this identification, having compared Hatcher's plant with the description and with a specimen in the Berlin Museum, which was collected by Philippi.

69. S. PALENÆ Phil.

Corymb with about 5 heads. White, *silky* herb. *Leaves* narrow-linear,

crowded at the base. Floriferous branches fastigiate. *Pedicels* naked, subequal. *Involucral* scales 12, immersed in wool. *Achenes* glabrous.

W. Patagon., valley of Rio Palena.

70. SENECIO PATAGONICUS Hook. & Arn. (= *S. microcephalus* DC.).

S. patagonicus Phil. = *S. sericeo-nitens.*

71. S. PINNATUS Poir.

Corymb few-headed. *Stem* terete, branching, the *leaves* crowded to the tops, sessile, pinnatipartite; their lobes linear-mucronate, some entire, others trifid. Pedicels bracteolate. *Involucral-scales* 10–12, nearly equalling the disk. *Ligules* 7–9; disk-flowers 20. *Achenes* glabrous.

(Brazil; Argentina); N. Patagon.; Tschalin.

S. PINNATUS GLANDULOSUS.

Dense *glandular-pubescence* upwards on the branches and leaves.

72. S. PŒPPIGII Hook. & Arn. (*S. micropifolius monocephalus* DC.)

Flower-heads solitary. Low, multiceps, all hoary-tomentose. *Stems* basally leafy; apically scapiform. *Leaves* oblong, subspatulate, obtuse, ending in a black point, laxly imbricate, entire, revolute-margined. *Peduncle* bracteate. Involucre campanulate, acute at base, calyculus with 16 leaflets, densely tomentose, subulate, with black sphacelate tops.

Patagon., by Moreno.

73. S. POLYPHYLLUS G. Kuntze.

Heads solitary on branches, leafless above. *Undershrub*, ascending, altogether puberulo-hirtellous. *Leaves* linear, entire, obtuse, margin subrevolute; the highest remote, few, bract-like. *Involucre* cylindraceous, as long as the disk, subnude at base, the scales about 15, subacute, sparingly ustulate at apex. Ligules 7–9, oblong; disk-flowers 15–20. *Achenes* glabrous.

(Chili, at elevations in Andes); S. Patagon., by Hatcher (as in the Gray Herbarium, but with thicker leaves. Near *S. sericeus neæi*).

74. S. PSAMMOPHILUS Griseb.

Corymb with 3–7 discoid heads. *Shrub* snowy-tomentose, with leafy branches 20 cm. long. *Leaves* linear, sessile, rounded-obtuse above, 1–2-crenate-pinnatifid or entire; lobes rounded. *Heads* 20-flowered.

Involucre broad, shorter than the disk, with 10–12 scales; the outer scales appressed, all sphacelate-obtuse at the apex. *Achenes* puberulous.

(Catamarca.)

SENECIO PSAMMOPHILUS DUSENII.

Branches more elongate than the type, virgate, flexuose. *Leaves* most entire, some pinnately 3-(or more) partite.

Patagon., at Puerto Madryn, by Dusén.

75. S. PULCHER Hook. & Arn.

Corymb of large heads, each 5 cm. broad. Handsome, simple or branching plant, sometimes a meter high, webby-tomentose, with deciduous wool. *Leaves* oblong-lanceolate, crenate-dentate, the radical as long as the petioles; cauline leaves remote, sessile, upwards semi-amplexicaul and subdecurrent. *Involucre* campanulate-hemispherical, calyculate, its scales not sphacelate, woolly, obtuse. Ligules 20, purple.

(S. Brazil); N. Patagon., by Rio Negro.

76. S. SERICEO-NITENS (Phil.) Speg. (*S. patagonicus* Phil. non H. & A.)

Radiate *heads* solitary, ending the branches. Silky-tomentose undershrubs, with long branches, naked upwards. *Leaves* narrow-linear, crowded, acute. *Involucre* without calyculus, its scales about 15, acute, tomentose, not sphacelate, scarcely shorter than the disk. Ligules to 12. *Achenes* glabrous.

Patagon.; by O. Nordenskjöld, in valley of Rio Gallegos.

77. S. SERICEUS (G. Ktze., 1831, sub *Cacalia*) O. Ktze.

This is made by O. Kuntze to include several species which have been separated chiefly by geographical marks; *low*, *shrubby*, with at least in youth a *silky-tomentose* indumentum; also as identical with *S. albicaulis*, *candolleanus*, *gilliesii* and *incisus*, H. & A. (1841); and *neæi* (with *leaves* entire, subglabrescent).

"Among these the size of the heads, the number of flowers in each, and the size of the leaves vary, the leaves being smaller in dry places. Entire and pinnatifid leaves may occur on the same shrub." (O. Ktze.)

78. S. SMITHII DC.

Terminal *corymb* of 6 or more broad, radiate heads. Erect, tall shrub, with hollow, simple *stem*, and leaves underneath or on both surfaces, lax-

woolly, fragrant. Radical *leaves*, long-petioled, oblong, basi-cordate, subacute, dentate, with sheathing petioles. Cauline leaves cordate or lanceolate, sessile, acuminate, crenate-dentate. *Heads* with yellow disk, 3–5 cm. across, with 15–16 white ligules, long-acute or apically dilated. *Pappus* shorter than the achene.

S. Patagon. and by Lago Argentino; not in steppe-region; W. Patagon., by Rio Aysen (Dusén); Magellan; Chiloe; S. Fuegia to Cape Horn. Handsome, nearly a meter high.

79. Senecio stipellatus O. Hoffmann.

Heads 2–4 at ends of the branches. *Undershrub*, 25 cm. high, branching at base and also above; leafy, striate, webby below. *Leaves* sessile, pectinately pinnatipartite, the segments and rachis equally linear; lower leaf-segments with *stipelliform lobules*. *Heads* midsized, peduncled, with a few acute bracts. *Involucre* broad-campanulate (8–10 mm.), its scales 20, apically sphacelate. Ligules yellow, twice as long as the involucre. *Achenes* puberulous. *Pappus* white. (Fig. 101.)

Fig. 101.

Senecio stipellatus. — Involucral scale. (After O. Hoffmann.)

Patagon., at Rawson, near mouth of Rio Chubut (Dusén).

80. S. subpanduratus O. Hoffmann.

Lax *corymb* of small, *discoid* heads. Glabrous *shrub*, 40 cm. high, with virgate, leafy branches. Lower *leaves* spatulate, upper oblong-panduriform, semiamplexicaul; all obtuse, repand-toothed or entire, graduating to subcordate bracts. *Involucre* broad, calyculate; its scales 20, narrow, acute, scarious-margined, as long as the disk, with an oleiferous vitta. *Flowers* perfect, yellow. *Achenes* puberulous. *Pappus* white, caducous.

E. Fuegia (Dusén).

81. S. subulatus D. Don.

Subcorymbose. Branching, glabrous *shrub*. *Leaves* linear-subulate, mucronate-awned, entire or pinnatifid. *Involucre* broadly cylindrical; its scales acute, costate, scarcely sphacelate, with calyculus of short, subulate bracteoles. Ligules about 14, linear, scarcely exceeding the diameter of the many-flowered disk.

(Chili); Patagon.

82. SENECIO TRIFURCATUS Less.

Head solitary on simple, scape-like *stem*, bracted. Glabrous *shrub*. *Leaves* spatulate, trifurcate, the radical fasciculate. *Involucral* scales without sphacelate tips. Rays pale. ("White-flowered," R. O. Cunningham.) (Fig. 102.)

W. Magellan, at Puerto Angusto (Dusén). Fuegia, in marshy places to Cape Horn. "Avoids the steppes." Rio Gallegos (Barnum Brown).

FIG. 102.

Senecio trifurcatus. — Plant with 1-headed scape; also magnified fruit.

83. S. TUNICATUS O. Ktze. (non Klatt.).

Head broad, discoid, solitary on a simple, scape-like, nearly leafless stem. Low, cespitose, 10 cm. high. *Leaves* crowded at base, 5 cm. by 5 mm., linear, scariose, fuscous-red, rather smooth, appressed to stem, persistent, upwards linear-lanceolate, entire, herbaceous, tomentose. *Head* 2 cm. broad, rose to purple, with 40–50 flowers as long as the involucre and longer than the white pappus. Involucral scales 40, 1-seriate, subequal, calyculate. *Achenes* smooth.

Patagon. (Moreno).

84. S. VAGINÆFOLIUS Sch. Bip.

Head solitary, discoid. Hoary, tomentose *undershrub*. *Leaves* crowded below, spatulate, entire, arising from a long, scariose sheath. Upper leaves few, remote, small, lance-linear, passing into the involucral scales. Base of *stem* with old leaf-sheaths. *Achenes* glabrous, shorter than the snowy pappus.

Punta Arenas, on the sea-shore.

85. S. VERRUCULOSUS O. Ktze.

Heads discoid, solitary on branches, nearly naked above. Low *shrub*, scarcely 25 cm. high, the branches densely leafy at the base. *Leaves* warty, glabrous, sessile, falcate, linear to subulate, broader next their apex, 1–2 cm. long. *Flowers* of head 30–40, yellow, longer than the involucre, as long as the white *pappus*, 1 cm. long. *Involucral* scales 25, 1-seriate, canaliculate, apically black-punctate, pilose. Calyculus of few bracteoles. *Achenes* glabrous.

Varying: (1) *subulatus* O. Ktze. *Leaves* subulate, their margin inflexed, rarely 1–2-toothed. Patagon.

(2) *dentatus* O. Ktze. *Leaves* broader, the margin narrowly inflexed, mostly 2–4-toothed. Patagon.

86. SENECIO VULGARIS Linn. Groundsel.

Heads discoid, 4 mm. across, 6 mm. high, *corymbed*. Puberulent or glabrate annual, with hollow, branched *stem*, 30 cm. high, and pinnatifid *leaves* with oblong toothed segments. *Involucral* scales linear, usually with a few short, outer bracteoles. *Achenes* hoary. *Pappus* white.

(Europe, naturalized in N. Amer.); Magellan; Tyssen Is. (R. O. Cunningham); S. Fuegia, at Ushuaia; Falklands. (Doubtless introduced.)

87. S. WEBSTERI Hook. f.

Subsessile *panicle* of *radiate* heads. Suberect or prostrate woolly herb, with leafy stem. *Leaves* petiolate, fleshy, reniform-rounded, or deltoid, with obtuse angles, entire or sinuate-crenate, glabrate above, woolly underneath, the margins revolute. *Involucre* broad, its scales oblong-lanceolate, acute, glabrate at least midway. *Ligules* broad-ovate, 3-toothed. Odoriferous.

Magellan; Staaten I.

S. WEBSTERI SUBDISCOIDES A. Gray.

Ligules few, small. Branches ascending. *Leaves* fan-shaped, crenate-toothed.

Fuegia, at Orange Harbor.

88. S. XANTHOXYLON Phil.

Heads *discoid, subcorymbose*. Low *shrubs*, branching fastigiately from the base, silvery silky. *Leaves* sessile, fleshy, linear, obtuse, entire or apically tridentate, with short, acute lobes. *Branches* naked upwards, with few heads, and few woolly bracts. *Involucral* scales pencillate above, dorsally villous. Flowers in a head about 30.

Patagon., by Rio Sta. Cruz.

S. XANTHOXYLON ARANEOSULUS Speg.

Leaves apically trifid or 3-toothed, margins revolute. Plant at first webby, afterward glabrate. *Corollas* orange; pappus white.

Patagon., at Golfo de San Jorge, and by Rio Sta. Cruz.

56. ERIACHÆNIUM Sch. Bip.

Small, prostrate herb, with small, alternate, oblong or subspatulate, amplexicaul *leaves*, woolly underneath; and short-pediceled, axillary heads. *Involucral* scales 5–8, subequal, erect. *Flowers* all tubular, having corollas connate with the achene, woolly on outside; peripheral flowers 1–2 (or none), with short tube, fertile; central larger, sterile, their *anthers* acuminately tailed.

Species 1, viz.:

E. MAGELLANICUM Sch. Bip.

Closely allied to *Osteospermum* which has many species in S. Afr. and one in St. Helena. *Leaves* coarsely toothed. (Fig. 103.)

Fuegia, passim, loving salt-water shores.

FIG. 103.

Eriachænium magellanicum.—Branch, and magnified flower-head (after Dusén).

57. CARDUUS Linn. (1753). Thistle.

Common prickly herbs, with spiny often decurrent *leaves*. *Achenes* inserted by the base, not obliquely, glabrous. *Receptacle* densely bristly. *Corollas* slender, tubular, 5-cleft, purplish or greenish. *Anthers* basi-sagittate. *Style-branches* obtuse. *Pappus* of plumose bristles, united at base, falling away together.

Species 250, widely distributed in N. Hemisphere.

C. LANCEOLATUS Linn. (Scop. sub *Cirsium*, 1772; Willd. sub *Cnicus*, 1787.)

Stout biennial, partly tomentose, to more than a meter high, leafy throughout. *Leaves* lanceolate, acuminate, deeply pinnatifid, about 12 cm. long, decurrent, with triangular lobes, general outline lanceolate, bristly all over. *Heads* solitary on the branches, dark purple. *Involucral* scales prickly like the leaves.

(La Plata, introduced from Eur., "Cardo Negro"); spreading (Eng. & Prantl include the thistles with plumose pappus in the genus *Cirsium* Scop.).

58. SILYBUM Gaertn. Giant Thistle.

Heads large, solitary, homogamous, nutant. *Involucral* scales with leafy appendages, bearing terminal spines and shorter, lateral spines.

Flowers purplish, with filaments connate half way up or more. Fruit and pappus of *Carduus*, pappus-setæ not feathery.

Species 2; in warm parts of Old World.

Silybum marianum Gaertn.

Leaves amplexicaul, sinuose-spinose, white-spotted (broader and thinner than of cardoon). (Fig. in Eng. & Prantl, iv, 5, p. 319, H.)

N. Patagon. by Rio Negro. (From S. Eur., W. Asia, etc.) In Argentina and Chili forms impenetrable groves. Its leaves are in quest for cattle and sheep. (In the dry season they are entirely gone.)

59. CYNARA Linn. Cardoon, Artichoke.

Biennial herbs resembling thistles, with ample, 1–3 times pinnatisect, spiny *leaves*, and large, solitary (?) *heads*, purplish to white. *Involucre* broad, of many-seriate, coriaceous scales, broad below, and imbricating, spiny-tipped (or under cultivation unarmed). *Receptacle* fleshy, plane, setose. *Corollas* slender-tubular. *Filaments* pilose, not connate. *Anthers* basisagittate, with connate tails. *Achenes* glabrous, thick, truncate. *Pappus* many-seriate, plumose, deciduous, with an annulus.

(Fig. in Eng. & Prantl, iv, 5, p. 323.)

Species 11, Mediterranean region; also cultivated and unarmed.

C. cardunculus Linn.

Head very large. *Leaf-segments* and involucral scales with only short spines. Fruit 4-angular.

(Europe, and naturalized in extra-trop. S. Amer.; also cult.); N. Patagon., near Rio Negro, not common there. (Heads 3 or 4, corymbed on the tall stem, in New York Botanical Garden.) Along with *Silybum marianum* forms impenetrable forests in Argentina.

60. CARTHAMUS Linn. Safflower.

Thistle-like herbs, with equal-flowered *heads*, solitary on the branches, or subcorymbose, yellow to purplish, not blue. *Involucre* ovoid or subglobose, its scales many-seriate, imbricate, the outer with leafy spinose tips. *Receptacle* chaffy-setose. *Anthers* with connate tails. *Achenes* glabrous, with oblique areoles. *Pappus* paleaceous or none.

(Fig. in Eng. & Prantl, iv, 5, p. 331.)

Species 20, Old World, from the Orient to the Mediterr. and Canary Is., and the following case of discontinuous distribution of the genus.

CARTHAMUS MAGELLANICUS Lam.

Unarmed. *Stem* herbaceous, simple, 16 cm. high, with 1 head. *Leaves* linear, entire, glabrous, diminishing upwards. *Head* small, naked, outer scales oval, glabrous, with short, lateral spines.

Magellan (by Commerson, 1767).

61. CHUQUIRAGA Juss. (*Dasyphyllum* H. B. & K., *Joannesia* Pers., *Chuquiragua* recentioribus.)

Shrubs, with paired, axillary spines or unarmed, and with homogamous or abortively dicœcious *heads*. *Involucre* turbinate to ovoid, its scales many-seriate, imbricate, rigid, linear or lanceolate, the outer ones shorter. *Receptacle* mostly pilose. *Corollas* densely bearded inside. *Anthers* basally sagittate-tailed. *Style-branches* obtuse, not spreading. *Achenes* oblong or turbinate, silky. Pappus-setæ 1-seriate, plumose.

Species 33, Andine, and Brazil.

KEY TO THE SPECIES.

A. Leaf-tips spinose. No axillary spines.
  b. Pubescent. Heads 6-flowered. *erinacea*.
  *b*2. Leaves glabrous, broader below, their apex becoming stout, sharp spines. Heads many-flowered. *hystrix*.
*A*2. Branches and leaves subulate-spinescent, hirsute. Involucral scales villous. *acicularis*.
*A*3. Spinescent leaf-tips and axillary spines.
  b. Axillary spines in pairs.
    c. Spines stout. Heads solitary, sessile in axils. Leaves broad-ovate. Achenes silky. *avellanidæ*.
    *c*2. Spines short. Leaves lanceolate from a broad base, sessile. Achenes silky. *dusenii*.
    *c*3. Leaves ovate-lanceolate, glabrous. Involucre villous, orange inward. *spinosa*.
    *c*4. Spines axillary, very small. Involucral scales broad, muticous, yellow inwards. *kingii*.
  *b*2. Axillary spines in 4's, short. Leaves long-linear, thick-margined. Involucre golden inwards. *patagonica*.

1. C. ACICULARIS Don.

Branches and *leaves* subulate-spinescent, hirsute. *Involucre* cylindra-

ceous; its scales ciliate-villous; the outer reflexed-spinescent. These and the receptacle scarcely puberulous.

S. Patagon., by Rio Gallegos, and Rio Sta. Cruz.

2. CHUQUIRAGA AVELLANIDÆ Lor.

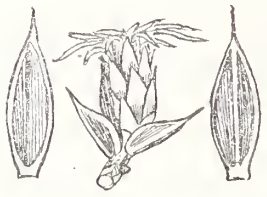
Woody; ramified from the base, with terete, sulcate *stem* and flexuose branches. *Leaves* sessile, broad-ovate, pungent-mucronate, generally concave, entire, mostly alternate, 17 by 9 mm.; spines paired in the axils, 3 mm. long, rather stout. *Heads* solitary, sessile in the axils, to 2 cm. long, cylindrical. Involucral scales many-seriate, the outer herbaceous, acuminate, the inner longer and narrower, the innermost long-linear, yellow above like an outer corolla, exceeding the flowers. Receptacle concave with white hairs. *Flowers* in the head not many. *Achenes* silky. *Pappus-setæ* 1-seriate, plumose, yellowish.

N. Patagon., by Rio Colorado, etc.; Chubut; S. Patagon., by Rio Chico. "Distinguished from *C. spinosa* by much larger leaves, broader and alternate; by much shorter, thick, brown spines; and involucral scales more numerous, with longer heads."

3. C. DUSENII O. Hoffmann.

Shrub, with erect branches, 16 cm., tomentose, with brown cortex when young. *Leaves* coriaceous, subconcave, lanceolate from a broad base, sessile, prolonged to a brown spine, entire, appressed-silky, at length glabrate, 3-nerved, the midnerve prominent; their margin thickened. Pairs of short axillary spines. *Heads* short, solitary on ends of branches, and sessile amid the shorter leaves. *Involucre* cylindrical; its scales many-seriate, imbricate, puberulous when young, the innermost exceeding the flowers, and with stellately recurved tips, the recurved part petaloid, linear, acute. *Achenes* silky. (Fig. 104.)

FIG. 104.



Chuquiraga dusenii. —Flower-head and involucral scales, natural size. (After O. Hoffmann.)

N. Patagon., by Puerto Madryn (Dusén). "Near *C. avellanidæ* but distinguished by having longer leaves with thickened margins."

4. C. ERINACEA D. Don.

Branches and leaves pubescent. *Leaves* subulate, concave above, spinescent tipped, without other spines. *Heads* 6-flowered.

(Fig. in Eng. & Prantl, iv, 5, p. 335, J.)

(Chili); N. Patagon.; widely spread there and northward. "Tschitri kekelu" and "Herba del Perdice" (Food of Rhea); S. Patagon., by the East Coast; by Hatcher on the Cordilleras, Feb. 1897.

5. CHUQUIRAGA HYSTRIX D. Don. (including *Flotovia hystrix*, Wedd. Chl. And. i, 6).

Larger and stronger than *C. erinacea*. *Leaves* glabrous, broader below, with sharp, brown point, pricking like needles, easily falling off the dry specimen. No other spines. *Heads* axillary, many-flowered. *Involucral* scales with somewhat webby margins.

Patagon., "its North limit is South of the Rio Negro. Very common thence to Rio Chubut." By Hatcher in Cordilleras of S. Patagon. Like the preceding it is called "Herba del Perdice."

6. C. KINGII Ball.

Axillary *spines* very small. Lateral nerves of *leaves* obsolete. *Involucral* scales rather broad, submuticous, with a cartilaginous apex; inner scales yellow. Otherwise as *C. spinosa*.

N. Patagon., to south of Rio Chubut. Indian name "Amtrac-tractschic."

7. C. PATAGONICA Phil.

Pubescent annual. *Leaves* alternate, linear, nervose, plane, mucronate, spinose; 28 by 2 mm., 3-nerved, the margin being thick like a nerve. *Spines* axillary, 4, short. *Involucral* scales, outer recurved, innermost long, acute, golden, ray-flowers female, sometimes 5-toothed.

Plain of N. Patagon., to Valdivian Andes.

8. C. SPINOSA Don.

Spines twin axillary. *Leaves* alternate, ovate-lanceolate, tips spinescent, glabrous, shining above, appressed-pubescent underneath. *Involucre* villous, its scales spinescent-tipped, the inner scales orange, thrice as long as the leaf. *Style* long-exsert.

(Peru and Cordilleras of Chili); N. Patagon.

62. DONIOPHYTON Weddel.

Like *Chuquiraga* but differing by having the *corollas* unbearded inter-

nally. Low, annual herbs, with small, linear *leaves* which often have minute, paired, axillary spines.

Species 4, in Chili and Argentina.

Doniophyton argenteum Speg.

"Differs from *Chuquiraga anomala* Don. and *C. Patagonica* Phil. by its axillary *spines* being always in pairs, distinct enough."

S. Patagon., by Rio Sta. Cruz and Rio Gallegos.

63. DUSENIA O. Hoffmann.

Low, annual herb, branching from the base, with linear-oblong, sessile *leaves*, the lower opposite, the upper alternate. *Heads* homogamous, of mid-size, *disciform*, solitary and sessile on the ends of the branches. Involucral scales many-seriate, imbricate, the outer mucronate, the inner long-acuminate. *Receptacle* slightly convex, naked. *Corollas* tubular, scarcely enlarged above, regular, 5-cleft. *Anthers* with connate tails. *Style-branches* short, not hairy. *Achenes* turbinate, silky. *Pappus* of 10 acuminate, 2-seriate pales.

(Near to *Gochnatia*, differing by the pappus.)

Species 1, viz:

D. patagonica O. Hoff.

About 7 cm. high. *Leaves* obtuse, fleshy; the upper webby. *Flowers* shorter than the involucre, yellow. (Fig. 105.)

N. Patagon., at Rawson, near the mouth of the Rio Chubut (Dusén).

Fig. 105.

Dusenia patagonica — Plant slightly reduced; also a single flower, with outer and inner involucral scales, enlarged. (After O. Hoffmann.)

64. GOCHNATIA H. B. & K.

Tomentose or glabrous and glutinous shrubs, with alternate, coriaceous, entire *leaves*, mostly tomentose underneath and rather small; *heads* sessile crowded at the ends of the branches, or panicled, discoid, yellow. *Involucre* scales many-seriate, imbricate, ovate-lanceolate,

or the inner ones long and dry. *Receptacle* naked or hairy. *Anthers* long-tailed. *Style* thickened upwards, subentire. *Achenes* 5-ridged, villous. *Pappus-setæ* copious, rigid, outer ones smaller.

Species 12, S. Amer., 1 in Bahama Is.

GOCHNATIA GLUTINOSA Don.

Viscous. *Leaves* linear-lanceolate, acuminate, veinless. *Heads* cylindrical, 5-flowered, fasciculate. *Involucral* scales lance-subulate.

N. Patagon., at Mendoza.

65. LAVIDIA Phil.

Heads discoid, medium-sized, terminal and sessile, many-flowered, all the flowers hermaphrodite. *Involucre* campanulate, its scales laxly imbricate, many-seriate, coriaceous, carinate, acuminate. *Receptacle* plane, glabrous. Outer *corollas* little cleft, bilabiate, their larger lip ovate, 3-toothed, the smaller bifid, apex revolute. *Inner flowers* tubular, sub-bilabiate, teeth cucullate. *Anthers* winged and long-tailed, tails plumose. *Styles* equal, thick, the branches short, obtuse, connivent. *Achenes* not truncate, papillose, at length ribbed. *Pappus-setæ* 1-seriate, rough.

Species 1, viz.:

L. CAESPITOSA PHIL.

Very low, cespitose shrub, with very short branches, 6 mm. thick. *Leaves* coriaceous, sessile, linear, entire, densely woolly at base.

Patagon., by Lago Pinto, and L. Argentino; Rio Sta. Cruz.

66. CYCLOLEPIS Gill. & Don.

Branching, hoary shrub, with rigid branches, sometimes spiny; and small, alternate, entire, coriaceous, silky *leaves*. *Heads* mid-sized, nearly sessile, ending the branches, discoid with a few flowers. *Involucral* scales many-seriate, broad-obtuse, dry scarious-margined; outer scales orbiculate. *Receptacle* naked. *Anthers* with long bearded tails. *Style-branches* obtuse. *Achenes* silky. *Pappus-setæ* rigid, barbellate.

(Differs from *Gochnatia* by involucre and style.)

Only one species, viz:

C. GENISTOIDES Gill. & Don.

Branches naked, terete, striate. *Leaves* sparse, linear-lanceolate.

(At Mendoza in Argentina. "Usillo"); N. Patagon., by Rio Negro; near Puerto Madryn. (Dusén.)

67. PLAZIA Ruiz &. Pav.

Shrubs of the habit of *Euphorbia*, with crowded, entire *leaves*. *Heads* mid-size, solitary (or corymbose), radiatiform, with hermaphrodite, or female, bilabiate ray; disk-flowers, having long, reflexed lobes. *Anthers* long-tailed. *Achenes* glabrous (or hairy), costate. *Pappus-setæ* several-seriate, unequal.

Species 8, Andes to Argentina.

P. ARGENTEA O. Ktze. (D. Don sub *Hyalis;* ita I. K. supp. 2).

Multicauline, silvery pubescent. *Stems* angled, simple. *Leaves* sessile, lance-linear, acuminate, entire. *Heads* paniculately corymbose. *Involucral* scales ovate-oblong, acutish, almost nerveless.

("Don's *Hyalis* has hairy or woolly fruit, wand-like branches, with few deciduous leaves." Eng. & Prantl.)

(Pampas of Cordova; characteristic of Bahia Blanca; "called 'Oliva,' also 'Maqui blanco'; its stem is used by the Indians as a masticatory." J. Ball.) N. Patagon.

68. PROUSTIA Lag.

Erect or climbing shrubs, sometimes hoary and sometimes spinose. *Leaves* alternate, coriaceous. *Heads* small, sessile on the branches, 3–5-flowered, all the flowers perfect and fertile. *Involucre* ovoid, its scales many-seriate, imbricate, ovate or the inner prolonged. *Receptacle* naked. *Corollas* bilabiate, or 1-lipped. *Anthers* long-tailed. *Style-branches* slightly flattened, rounded. *Achenes* 5-costate, villous or glandular. *Pappus-setæ* copious.

Species 10, Mexico, by the Andes to extratropical S. Amer.

1. P. BACCHAROIDES D. Don.

Shrub, with oblong, mucronate, dentate-spinulose *leaves*, snowy tomentose underneath. *Heads* 3-flowered, paniculate. *Involucral* scales obtuse. *Achenes* pilose. *Pappus* white, tufted above.

N. Patagon.

2. P. PUNGENS Poepp.

Erect, glabrous shrub, the uppermost branches apically spinescent. *Leaves* petiolate, lanceolate or cuneate, mucronulate, toothed, or entire, coriaceous. *Heads* laxly spicate, pink. *Achenes* cuneate-trigonal, villous. *Pappus* capillary, fuscous-purple.

PROUSTIA PUNGENS ILICIFOLIA (H. & A.) DC.

Leaves oblong, with a broad base, sinuate-dentate, petiolate. (Chili; Argentina); N. Patagon.

69. MUTISIA Linn.

Erect or climbing shrubs, with alternate *leaves* (sometimes pinnate and with cirrhi), and large or long *radiate heads*, terminating the branches. *Involucral* scales many-seriate, imbricate, broad. *Corollas* of the ray 1–2-labiate, of the disk cleft towards the center. *Anthers* long-tailed. *Style* filiform, minutely 2-lobed. *Achenes* glabrous. *Pappus* 1-seriate, of rigid, plumose bristles.

(Fig. in Eng. & Prantl, iv, 5, p. 344.)

Species 60, in warm parts of S. Amer.

Species with pinnate leaves are in hot regions; others are extratropical, or in mountains.

KEY TO THE SPECIES.

A. Procumbent, with hoary, angular branches. Leaves lanceolate to ovate-oblong, subcordately amplexicaul. Involucral scales appendaged. *oligodon.*

A2. Erect.

b. Leaves ovate, glaucous, amplexicaul, toothed-spinose. Heads coarse. *glauca.*

b2. Leaves cordate-amplexicaul, toothed-spinose. Involucral scales long-appendaged. Ligules short. *brachyantha.*

b3. Tall; peduncles long, 1-headed.

c. Leaves ovate, truncate to retuse, glabrous. *moyanoi.*

c2. Leaves ellipitical, subtruncate, glabrous above, tomentose underneath. *pulchella.*

A3. Climbing.

b. Leaves semi-runcinate-pinnatifid, partly decurrent. Tendril trifid. Involucral scales appendaged. *retrorsa.*

b2. Wingless. Leaves glabrous with a simple tendril.

c. Involucral scales not appendaged. Leaves elliptical. Peduncle 1-headed. *chubutensis.*

c2. Involucral scales appendaged. Leaves cordate, spinose-toothed. *ilicifolia.*

b3. Subalate. Leaves lanceolate-linear, subdecurrent.

c. Leaves spinose-toothed, with simple tendril. Heads large; involucral scales appendaged. *subspinosa.*

c2. Leaves subentire, ending in a bifid tendril.

d. Involucral scales appendaged. *decurrens.*

d2. Involucral scales not appendaged. *patagonica.*

1. M. BRACHYANTHA Phil.

Very glabrous. *Stem* broadly winged, the wing coarsely toothed. *Leaves* cordate-amplexicaul, oblong, coarsely spinose-toothed, ending in

a simple cirrhus. *Involucre* broad-cylindrical, the outer scales with a long, narrow-linear appendage. *Ligules* half as long as the involucre, scarcely exceeding the disk-flowers.

(Chili, Talca); Chubut, in hill-shrubberies.

2. Mutisia chubutensis Speg.

Stems tall, 50–300 cm., climbing, wingless, glabrous. *Leaves* subentire, elliptical, apex rounded, not or scarcely retuse, glabrous on both sides, with a simple *cirrhus*. *Peduncle* not long, 1-headed. *Involucral* scales, outer small, triangular-lanceolate, the others broadly ovate, not appendaged. *Ligules* twice as long as the involucre.

Chubut, in preandine shrubberies.

3. M. decurrens Cav.

Stem climbing, subangulate or subalate. *Leaves* sessile and decurrent by both margins, pinnately-veined, lance-linear, plane, entire, the lower few-toothed at base; mid-nerve produced to a bifid *cirrhus*. *Involucre* ovoid, its scales ovate, appressed, appendiculate, obtuse.

(S. Chili); Chubut, in preandine groves; a form with larger leaves marginally revolute and often obsoletely toothed midway on both sides. (Speg.)

4. M. glauca Phil.

Glabrous. *Stem* terete; *leaves* ovate, amplexicaul, coriaceous, dentate-spinose, glaucous; *cirrhi* simple or trifid. *Heads* coarse. *Involucral* scales broad-triangular, ovate, mucronate, sparsely tomentose. *Ligules* about 20, broad, obscurely purplish.

(Chili); Chubut, upland shrubberies.

5. M. ilicifolia Cav. (*M. truncata* D. Don.)

Stem climbing, terete, wingless. *Leaves* sessile, cordate, amplexicaul, reticulate, coriaceous, their margins coarsely spinose-toothed, glabrous both sides when adult, their midrib produced as a *cirrhus*. *Involucre* ovate-oblong, with the outer scales ovate and apically appendaged; inner scales obtuse.

(Chili); Patagon. (M. and T.).

MUTISIA ILICIFOLIA TRUNCATA (Don.) DC.

Delandotte regards this as a young condition of the species; having *leaves* cordate-oblong, spinose-toothed at base and apex, and involucre cylindrical.

(Chili); Patagon.

6. M. MOYANOI Speg.

Stems wingless, glabrous, 300–500 cm. tall, densely branching. *Leaves* alternate, glabrous on both surfaces, ovate, apically truncate to retuse or bilobed, margin entire or irregularly toothed; reticulately nerved with a long *cirrhus*. *Peduncles* long, 1-headed. *Involucral* scales, outer linear, reflexed; the others ovate; the outermost appendaged. *Ligules* twice as long as the involucre.

Chubut, in preandine shrubberies.

7. M. OLIGODON Poepp. & Endl.

Procumbent; branches angular, rather strict, hoary-tomentose. *Leaves* lanceolate or ovate-oblong, acutish, sessile, subcordately amplexicaul, apically sinuate on one or both sides, or 2-toothed; margin entire, plane; glabrous above, tomentose underneath. *Heads* terminal, peduncled. Lower *involucral* leaves with a lanceolate appendage, squarrose; upper ones obtuse, bearded at apex. *Corollas* of female ray elliptical, pink.

(S. Chili, in rocky alpine plains); Patagon. (M. and T.).

8. M. PATAGONICA Phil.

Stems climbing, subangulate or subalate. *Leaves* decurrent, lance-linear, 8 by 2 cm., ending in a bifid *cirrhus*, plane, entire, save 1–2 basal teeth, underneath wool-webby, a cottony bud in the axils. *Involucre* subcylindrical, its scales appressed, ovate, not appendaged. *Rays* in lower part densely woolly-webby.

(Chili); N. Patagon., by Lago Nahuel-huapi; Chubut, by Lago Fontana.

9. M. PULCHELLA Speg.

Stems 50–250 cm. tall, wingless. *Leaves* subentire, elliptical, apically truncate-bidentate or rounded, glabrous on upper surface, densely tomentose underneath, having a simple *cirrhus*. *Peduncles* long, 1-headed. *Involucral* scales external, few, linear, acute, reflexed; others broadly

ovate, not appendaged, but the innermost marginally hairy-ciliate. *Ligules* twice as long as the involucre.

Chubut, in preandine shrubberies.

10. MUTISIA RETRORSA Cav.

Stem climbing, terete, winged by the decurrent leaf-traces. *Leaves* lance-linear, plane, entire ("semi-runcinate-pinnatifid," O. Ktze.), the lower few-toothed at their base, with their nerve ending in a bifid *cirrhus*. *Involucre* ovate; its scales appressed-ovate, appendiculate, obtuse.

(S. Chili, in mountain meadows); Patagon. ("Cirrhus simple," as in DC. Prodr. is erroneous. O. Ktze.)

M. RETRORSA LATIFOLIA O. Ktze.

Leaves broader, ovate (less one-third), pinnatifid.

Patagon.

11. M. SUBSPINOSA Cav.

Stem climbing, terete, subalate. *Leaves* sessile, basally decurrent, lanceolate-linear, spinose-toothed, glabrous; the midnerve produced to a simple *cirrhus*. *Involucre* cylindrical, its scales appendaged. *Heads* large, with golden ligules.

(Peru; Chili); Patagon. (Moreno and Tonini).

70. BRACHYCLADOS Don.

Rigid, branching *shrub*, with alternate, linear, entire *leaves*, their margins sometimes revolute; and rather large, peduncled, terminal, solitary heads on the branches. Ray- and disk-flowers fertile, mostly yellow. *Involucre* broad, its scales many-seriate, imbricate. *Anthers* long-tailed. *Styles* obtuse, slightly 2-lobed. *Achenes* 5-ribbed, glandular. *Pappus-setæ* several-seriate, copious.

Species 6, Patagon. and Argentina.

1. B. INVOLUTUS O. Ktze.

Tall, with glabrescent, striate branches. *Leaves* solitary, or in sets of 2–4, puberulent, subfalcate, ± 1 cm. by 2 mm.; sessile, acute both ways, one side more canaliculate. Peduncles 3 cm.; *heads* solitary, 2 cm. long and broad. Ray-flowers 12; disk-flowers 20. *Involucral* scales 3–4-seriate, externally tomentose, except the nerve; inner scales 15 by 3 mm., outer scales gradually shorter and revolute.

Patagon. (M. and T.).

2. BRACHYCLADOS LYCIOIDES Gill. and Don.

Differs from *B. involutus*, by having scarcely half as many involucral scales; which are not acuminate nor revolute; and by having smaller *heads*, and the *leaves* nearly twice as long.

(Andes of Mendoza); N. Patagon., by Rio Negro.

3. B. MACROCEPHALUS O. Ktze.

Low shrub, 50 cm. or more. Branches not striate, the young woolly. *Leaves* basally 5–8 times dilated; their dead bases persisting on the branches. *Heads* subsessile, 3 cm. broad, 2 cm. long; yellow. Ray-flowers 20; disk-flowers 40. *Involucral* scales as *B. involutus*, but very acute and rather rigid.

Patagon.; Lagos, about 50th parallel (Carl Burmeister).

4. B. OBTUSIFOLIUS O. Ktze.

Low, robust, 10 cm. high, densely pulvinate-branching. *Leaves* falcate, obtuse, epiphyl glabrous, hypophyl hoary and canaliculate; 6 by 1.3 mm.; basally somewhat dilated. *Heads* subsessile, 1 cm. broad and long; ray-flowers few; disk-flowers about 30. *Involucral* scales about 20, oblong, obtuse, apiculate.

Patagon. (M. and T.).

5. B. PYGMÆUS O. Ktze.

Very low, robust, prostrate, 15 cm. high; very pulverulent, with crowded branches. *Leaves* with widening base, woolly when young; the dead bases persisting on the branches. *Heads* subsessile, 15 mm. long and broad. Flowers smaller than in *B. macrocephalus*. *Involucral* bracts 15–20, acute.

Patagon. (M. and T.).

71. TRICHOCLINE Cass.

Perennial, herbs, with 1-headed, mostly leafless *scapes*. *Leaves* rosulate. *Heads* rather large, yellow, radiate. *Involucre* broad; its scales many-seriate, imbricate. *Receptacle* plane, nearly naked. *Ray-flowers* bilabiate, disk-flowers tubular, or all ligulate. *Anthers* long-tailed. *Style-branches* short, wide. *Achenes* 5-costate. *Pappus-setæ* many-seriate, copious.

Species 28, extratropical S. Amer., and Australia.

1. TRICHOCLINE HETEROPHYLLA Less.

Leaves glabrous or laxly villous, long-petioled, oblong, entire or pinnatifid. *Involucral* inner scales obtuse or acute, their margins scarcely scarious, not undulate.

(Brazil; very common about Bahia Blanca, called "Chucho," but the true Chucho is solanaceous); probably in N. Patagon.

2. T. INCANA Cass.

Stem leafy; its base densely woolly; the *leaves* snowy-tomentose underneath, entire, or mostly pinnatifid, their segments subentire. *Involucral* scales lanceolate, white-woolly below, acuminate, subequal.

(Fig. in Eng. & Prantl, iv, 5, p. 341, G, H.)

(S. Brazil; Argent.); N. Patagon., near Rio Negro.

72. CHAPTALIA Vent.

Mostly stemless herbs from a perennial caudex. *Leaves* snowy underneath. *Scapes* 1-headed, leafless, but often with bracts under the radiatiform head. *Involucral* scales several-seriate, imbricate, narrow, acuminate, smaller outwards. Outer flowers ligulate, fertile; inner short-filiform; innermost bilabiate. *Anthers* tailed. *Style-branches* obtuse. *Achenes* narrowing upwards to a rostrum. *Pappus-setæ* copious, barbellate.

(Fig. in Eng. & Prantl, iv, 5, p. 341, J–N.)

Species 21, Mex. and W. Indies to Argentina.

C. INTEGRIFOLIA (Cass. sub *Leria.*)

Leaves elliptic-oblong or lanceolate, entire or with a few spinulose teeth, white-tomentose underneath. *Scape* 30–45 cm. high; head at length nodding. *Involucral* scales linear, apically subulate. *Achenes* angled, minute, puberulous, 4 times shorter than the rostrum.

(Brazil); N. Patagon.

73. MACRACHÆNIUM Hook. f.

More or less woolly herb, almost *stemless*, with tall, slender, 1-headed scape, and runcinate-pinnatifid *leaves*. *Heads* homogamous; corollas bilabiate. *Involucre* narrowly campanulate, its scales few-seriate, imbri-

cate. *Receptacle* naked. *Anthers* long-tailed. *Style-branches* truncate. *Achenes* linear, striate. *Pappus* long-plumose.

Species 2. S. Patagon. and Fuegia.

1. MACRACHAENIUM FOLIOSUM Alboff.

Stem to 50 cm. tall, erect, weak, nodding under the head, sparsely woolly above; 3–7-foliate, rarely leafless. Radical *leaves* large, broad-oblong, deeply runcinate-pinnatifid; the lobes on each side 2–4, broad-oblong, few-lobulate, their lobules ending in a point; white-tomentose underneath. Petioles long, narrowly winged, floccose. *Cauline* leaves smaller, on shorter petioles. *Involucre* ovate-cylindric, woolly. *Pappus* white, yellowish at base.

Fuegia, by Beagle Channel; at Ushuaia, Valley of Rio Olivaią; Navarin I.

2. M. GRACILE Hook. f.

Scape 60 cm. high. Head 25 mm. long. *Flowers* white. A fine plant.

Magellan; by Hatcher, in Cordilleras of S. Patagon.

74. NASSAUVIA Juss.

Cespitose or diffuse undershrubs or herbs, glabrous or villous, with leafy, flowering branches. *Leaves* alternate, imbricate, often patent or recurved, rigid and ciliolate. *Heads* sessile, in glomerules, or few, or solitary; homogamous, few-flowered (3–5, or fewer), with oblong involucre, the few-seriate scales rigid, acute or subspinescent. *Receptacle* naked. *Anthers* long-tailed. *Style-branches* truncate. *Achenes* glabrous or villous. *Pappus* of pales or setæ, 1–2-seriate, often flat, rarely only 5–6.

(Fig. in Eng. & Prantl, iv, 5, p. 348, A, B.)

Species 25, extratropical. S. Amer and Andes. "The woody group of this genus is nearly peculiar to continental S. Amer., and to its drier parts; not crossing the Strait of Magellan on its western side; but on the east a few stretch down to Port Gregory, Staaten I., and the Falklands."

SECTIONS OF THE GENUS:

1. *Nassæa.* Heads in terminal, globular or ovoid glomerules. Pappus-scales 3–5, 1-seriate, not plumose, easily deciduous.
2. *Strongyloma.* Heads in axillary glomerules, and these in a long, leafy spike.

3. *Panargyrus.* Heads in terminal glomerules. Pappus-setæ numerous, 1–2-seriate, not easily deciduous, sometimes plumose.

4. *Mastigophorus.* Heads solitary. Pappus-scales numerous, 1–2-seriate, or few.

KEY TO THE SPECIES.

A. Heads in terminal glomerules.
  b. *Nassæa.* Pappus pales 3–5, deciduous. Shrubs with ovate leaves.
    c. Leaves dimorphous, spiniferous, entire on sterile shoots, pinnatifid on floral stems. *heterophylla.*
    c2. Leaves imbricate, spinose-toothed. Low, branching, glabrous. *nordenskjoldii.*
    c3. Leaves glabrous, rigid, imbricate, black-tipped. Dwarf cespitose. *pumila.*
    c4. Leaves revolute, with impressed parallel costæ.
      d. Glomerules subglobose.
        e. Leaves entire, hirsute on lower surface. *nivalis.*
        e2. Leaves spinulose-serrate, pubescent at first. *revoluta.*
      d2. Glomerules large, ovate. Leaves serrate, silky. *serpens.*
      d3. Glomerules in a short spike. Leaves gray-pubescent. *dusenii.*
    c5. Leaves imbricate, impressed-striate, recurved margin and apex, silvery underneath. Glomerules at length leafy. *argentea.*
  b2. *Panargyrus.* Pappus setæ 1–2-seriate, often plumose, not deciduous.
    c. Fruticose.
      d. Cespitose.
        e. Leaves linear, rigid, entire, glabrous. Pappus plumose. *abbreviata.*
        e2. Leaves obovate-cuneate, recurved, covering all the stem. *lagaseæ* (of H. & A.).
      d2. Stem and leaves silky. Pappus plumose.
        e. Leaves linear-subulate, short. Heads in a terminal golden mass. *candollei.*
        e2. Leaves linear, subulate, pungent. Flowering branches scape-like. *darwinii.*
        e3. Leaves sparse, linear, entire, soft, obtuse. Heads crowded apically on the branches. *laxa.*
      d3. Hoary velvety. Ascending. Leaves crowded at base, pinnatifid, spinose. Terminal racemes on branches. *spinosa.*
    c2. Herbs, with spinose leaves.
      d. Erect, simple stem. Leaves villous, cuneate, ovate, incised. *suaveolens.*
      d2. Subcespitose. Leaves glabrous to webby, linear-lanceolate. Pappus not plumose. *subspinosa.*
A2. *Strongyloma.* Heads in axillary glomerules, forming a leafy spike.
  b. Leaves oval, toothed-ciliate at base, apically recurved. Cespitose shrub. Pappus pales 3–4. *pygmæa.*
  b2. Primary leaves subtending secondary fascicles.
    c. Primaries subulate, sheathing.
      d. Secondaries linear-mucronate, recurved. Heads subternate. *axillaris.*
      d2. Secondaries complicate-incurved. Heads solitary. *glomerulosa.*

*c*2. Primaries spinescent. Secondaries rosulate.
d. Primaries linear-subulate. Secondaries minute, ovate. Heads in 2's or 3's, 1–2-flowered. *patagonica.*
*d*2. Primaries broad-subulate; secondaries short, obtuse. Heads subglomerate. *rosulata.*
*b*3. Leaves cuneate-oblong, serrate, imbricate. *magellanica.*
*b*4. Leaves ovate, spinose, serrate. Glomerules in a leafy raceme. *pyramidalis.*
*A*3. *Mastigophorus.* Heads solitary. Pappus pales 1–2-seriate.
b. Low, branching shrubs, with short, broad, thick, sessile leaves, imbricate and amplexicaul.
c. Heads sessile.
d. Leaves recurved, silky; 5 white flowers in the head. *ameghinoi.*
*d*2. Leaves orbicular, emarginate; 5 yellow flowers. *bryoides.*
*d*3. Leaves deltoid, pilose-glabrescent, entire or two-toothed. *morenonis.*
*c*2. Heads small, solitary on short branches. Leaves suborbicular-deltoid, silky. Achenes villous. *modesta.*
*b*2. Low, branching, with leaves longer than wide.
c. Heads terminal, solitary.
d. Leaves linear-subulate, spinulose-toothed. Petioles dilated at insertion. *remyana.*
*d*2. Leaves lanceolate, spinulose-serrate. *gaudichaudii.*
*c*2. Leaves narrow, pungent. Achenes villous.
d. Heads on short axillary branches. Leaves linear. *scleranthoides.*
*d*2. Heads solitary, ending the branches. Leaves subulate. *ulicina.*
*b*3. Cespitose. Leaves spiniferous.
c. Leaves ovate, glabrous; branches cottony below. Achenes glabrous. Heads small, solitary in the axils. *chubutensis.*
*c*2. Leaves ovate-triangular, recurved; those on sterile branches basally cucullate, ending in a long spine. Heads terminal, solitary. *struthionum.*

1. NASSAUVIA ABBREVIATA (Hook. & Arn. sub *Panargyrus*).

Cespitose, glabrous, branching at the base, substoloniferous. *Leaves* rigid, spreading, recurved, linear, acuminate, mucronate, entire, sheathing at the base, with silky axils. *Heads* in terminal hemispherical glomerules. *Pappus* plumose.

Magellan; N. Fuegia (Dusén).

N. ABBREVIATA SUBSPINOSA Phil.

Chubut, in dry rocks; Fuegia.

2. N. AMEGHINOI Speg.

(*Mastigophorus.*) Shrubby, branching, cespitose. *Leaves* remotely imbricate, recurved, minute, thick, entire, their venter convex, glabrous, 2-sulcate, dorsally appressed, silky-villous, sessile, 1-toothed on each side

of sheath, subscarious, amplexicaul. *Heads* apical, solitary, sessile; with 5 white *flowers*.

Patagon., by Golfo de San Jorge.

3. NASSAUVIA ARGENTEA Phil.

Stems ascending, branching. *Leaves* imbricate all over the stem, semi-amplexicaul, ovate-oblong, acute, with recurved margin and apex, their upper surface parallel-impressed-striate and pubescent; the under surface with dense silvery silk. *Heads* crowded in a glomerule, at length leafy.

(Chili, Valdivian Andes, in snow); Chubut Mts. ("Var. of *N. navalis*." Speg.).

4. N. AXILLARIS Don.

Primary *leaves* subulate-trigonous, cucullate-sheathing at base. *Secondaries* fasciculate, linear-mucronate, recurved. *Heads* subternate.

(Argentina); Patagon. M. & T.

5. N. BRYOIDES O. Hoffmann. (Plate XXVIII, A.)

Dwarf shrub, branching, forming a cushion; the branches short and densely leafy. *Leaves* close, imbricate, sessile, orbiculate, entire, pale at base, green at apex, emarginate, slightly complicate. *Heads* sessile, solitary at ends of some branches, radiant. *Involucre* cylindrical, of 8–10 scales, the outer ovate, the inner elliptic, all sparsely villous and mucronate. *Flowers* 5, yellow. *Achenes* silky. *Pappus-pales* linear, silky.

"Assumes many forms," "habit of *Androsace*."

S. Patagon., in Upper Valley of the Rio Gallegos (Nordenskjöld); by Rio Chico de la Sta. Cruz (Hatcher).

6. N. CANDOLLEI Macl. (*Panargyrus lagascæ* DC. 1838 non *Caloptilium lag* H. & A. 1835).

Stem and leaves silky; the *leaves* linear-subulate, short, revolute, supporting the *heads* which are conglomerate in a terminal, hemispherical, golden mass. *Pappus* plumose.

S. Patagon. (by Hatcher in the Cordilleras. Feb. 11, 1897. One specimen has two heads close together on a forking branch).

7. N. CHUBUTENSIS Speg.

Undershrub, laxly pulvinate-cespitose, branchlets long, erect, cottony below, glabrate towards the apex, laxly leafy. *Leaves* glabrous, ovate,

with 2 spreading spines on the margins, and a larger trifid apical spine. *Heads* small, solitary at the axils of the upper leaves, involucral scales 8. *Flowers* 5, white. *Achenes* obovate, glabrous.

Chubut, in dry, gravelly valleys.

8. NASSAUVIA DARWINII (Hook. & Arn. sub *Panargyrus*).

Cespitose and woody, branching at base and appressed-silky. *Flowering-branches* long, sparsely leafy, scape-like above. *Leaves* linear-subulate, pungent, entire, their margins obscurely revolute. *Heads* crowded in larger heads at ends of branches, with subulate bracts. *Pappus* 1-seriate, plumose.

Magellan; Puerto Deseado; E. Fuegia (Dusén). ("Chiefly in the Eastern parts; a steppe plant.") Killik-Aike (Barnum Brown).

9. N. DUSENII O. Hoffm., n. sp.[1] (Plate XXX, C, D.)

Low undershrub, branching from the base, the branches ascending, and covered from base to apex by closely imbricate leaves; leaves grey-pubescent on both surfaces, ovate or ovate-lanceolate, acuminate, briefly spinose-mucronate, sessile with a broad base, the upper surface with many parallel striæ, the margin with short spinose teeth from the excurrent nerves. Upper leaves erect, plane; the lowest reflexed from their base. Heads crowded in a short, cylindraceous, terminal spike. Bracts leafy, slightly shorter than the subtended head.

Branches, as well as the whole plant examined, 10 cm. long. Leaves 12 mm. long by 5 mm. broad. Spike about 3 cm. long, 2 cm. broad.

W. Patagon., by Rio Aysen. Coll. Dusén, Feb. 13, 1897 (n. 584).

10. N. GAUDICHAUDII Cass. (DC. sub *Mastigophorus*.)

Stem shrubby, branching, cespitose. *Leaves* lanceolate, carinate, nervose, acute, with recurved margin, spinulose-serrate. *Heads* solitary, terminal. *Pappus* of broad pales

(*N. pygmæa* H. f.? Approaches *N. glomerata* Gill.)

Magellan; Falklands; S. Patagon. (Hatcher).

[1] NASSAUVIA DUSENII O. Hoffm., n. sp.

Suffruticosa humilis, a basi ramosa, ramis adscendentibus foliosis, foliis a basi usque ad apicem arcte imbricatis utrinque griseo-pubescentibus ovatis vel ovato-lanceolatis acuminatis breviter spinoso-mucronatis, basi lata sessilibus, supra parallele multistriatis, margine nervis excurrentibus breviter spinoso-dentatis, superioribus erectis planis, inferioribus a basi reflexis; capitulis in spicam terminalem breviter cylindraceam congestis, bracteis foliaceis capitulo suffulto paulo brevioribus.

11. NASSAUVIA GLOMERULOSA Don. (DC. sub *Strongyloma.*)

Primary *leaves* subulate, dilated at base; *secondaries* complicate incurved, muticous. *Heads* solitary. (Near *N. axillaris.*)

(Chili, in high Andes); Patagon.

12. N. HETEROPHYLLA Alboff.

Long, creeping *rhizome*, sending up floriferous, villous stems and sterile, glabrous shoots. *Leaves* dissimilar; on the shoots ovate-lanceolate to ovate, entire, ending in long spines; on the flowering *stems* broader, pinnatifid, with linear, spinescent segments, rarely apically toothed. *Heads* in an ovoid, terminal raceme. *Involucral* scales leaf-like but broader, villous. Beautiful, with white, aromatic flowers.

Fuegia, mountains near Ushuaia.

13. N. LAGASCÆ (H. & A. sub *Caloptilium*, 1835).

Cespitose. Leaves imbricated, oboval-cuneate, crenulate, nervose-striate, recurved, covering all the stem. *Heads* glomerate at the apex of the stem, with sessile glomerules.

S. Patagon., by Lago Argentino, Chubut in mountain rocks.

14. N. LAXA (Phil. sub *Panargyrus*).

Silvery-silky. Stem laxly branching, procumbent, the flowering branches ascending. *Leaves* sparse, linear, entire, obtuse, herbaceous, soft, 13 by 2 mm. *Heads* crowded at the tops of the branches. *Floral-leaves* lance-linear. *Pappus* plumose. *Branches* 12 cm. long.

S. Patagon., by Rio Gallegos.

15. N. MAGELLANICA Gmel.

Stem ascending, closed with alternate, imbricate *leaves*, which are cuneate-oblong, pointed, deeply serrate. *Spike* simple, dense, terminal, invested with ovate, acute bracteoles. Exquisitely scented.

Magellan.

16. N. MODESTA O. Hoffmann.

(*Mastigophorus.*) *Low*, branching shrub, 10 cm., rooting at base. *Leaves* imbricate, suborbicular, amplexicaul, the limb deltoid, mucronate, entire, minutely silky-puberulous. *Heads* small, solitary, ending the short, few-leaved branches, sessile. *Involucral* scales 5, broad-elliptical,

mucronate, 3-nerved. *Flowers* 5, outer lip radiant. *Achenes* silky-villous. *Pappus-pales* 5, white-silky.

S. Patagon., by Rio Guillermo (Nordenskjöld).

17. NASSAUVIA MORENONIS O. Ktze.

(*Mastigophorus.*) Densely *cespitose* herb, with thick, short, rooting branches, 2–3 cm. high. *Leaves* imbricate, amplexicaul, pilose-glabrescent, deltoid, 2–3 mm. long, and basally as broad, apex obtuse, recurved, thick, entire or 2-toothed. *Head* solitary, sessile, terminal. Involucral scales 4, scarious, ovate, 2 mm. long, spinose-acuminate, with a reflexed point, denticulate, pilose; with 2 linear, shorter bracteoles. *Flowers* 4–5, bilabiate. *Pappus-setæ* 4, pilose, sublanceolate. Achene glabrous.

Patagon. (M. & T.).

18. N. NIVALIS Poepp.

Stem suffruticose, creeping, ascending, sparsely branching. *Leaves* imbricate its entire length, amplexicaul, broad-ovate, recurved at apex, rough below, smooth above, with parallel, impressed striæ, entire. *Heads* in a subglobose glomerule, slightly exceeding the bracts. *Achenes* oblong, turbinate, glabrous. *Pappus* of 1-seriate, linear pales. (Near *N. serpens.*)

(S. Chili, at 2,500 m. elevation); S. Patagon., in Cordilleras, by Hatcher.

19. N. NORDENSKJOLDII O. Hoffmann. (Plate XXVIII, B.)

Low, branching, glabrous shrub. *Leaves* closely imbricate, ovate, with a broad base, semiamplexicaul and soft-toothed, and spinose-toothed above. *Heads* glomerate at the end of the branches, each with a leafy bract. *Involucral* scales 2–3-seriate, 6–10 sublanceolate, entire. *Achenes* glabrous. *Pappus-pales* 3–5, white, caducous.

S. Fuegia, by Beagle Channel; S. Patagon., in Valley of Rio Gallegos (Nordenskj.); and on volcanic rocks at high altitudes near head of Rio Chico de la Sta. Cruz (Hatcher).

20. N. PATAGONICA Speg.

(*Strongyloma.*) Primary *leaves* linear-subulate, rigid, spinescent, at first erect-pubescent, afterwards spreading, glabrous. Secondary leaves minute, ovate, obtuse, sessile, sheathing, fascicled, and rosulate in the axils of the primaries. *Heads* in 2's or 3's, sessile on the apex of the peduncles,

from axils of the primary leaves, 1–2-flowered, the outer bracts spinescent; the inner appressed, unarmed.

Patagon., by Golfo de San Jorge; Killik-Aike (Barnum Brown).

21. Nassauvia pumila Endl. & Poepp.

Glabrous dwarf, cespitose, branching. *Leaves* rigid, apically recurved, imbricate, sessile, ovate, acute, ciliolate at the base, apically blackish and 3-toothed, the teeth denticulated. *Heads* sessile, terminal, crowded amid the leaves, 5-flowered. *Involucral* scales scarious, apically black, the outer shorter and narrower. *Achenes* obovate. *Pappus-pales* 3–5, caducous, longer than the achenes.

Patagon., Chubut, in mountains; Fuegia, alpine above Ushuaia.

22. N. pygmæa Hook. f. (DC. sub *Strongyloma;* H. & A. sub *Acanthophyllum.*)

Shrubby, cespitose, glabrous. *Leaves* oval, acute, dentate-ciliate at their base, apically recurved. *Heads* crowded at the apex, intermixed with floral leaves. *Pappus-pales* 3–4.

Magellan; Fuegia, by Orange Harbor and Blossom Bay. (As *Triachne*, save that its pappus is as *Nassauvia pumila*, DC. Prodr., vii, 50. "Like a starved specimen of *N. gaudichaudii.*" J. D. H.)

23. N. pyramidalis Meyen.

Glabrous, suffruticulose, branches strict. *Leaves* ovate, rigid at base, spinose-serrate, ending in a spinose point. *Heads* crowded in the uppermost axils, making an ovoid raceme; lower bracts exceeding the heads. *Receptacle* naked.

Near *N. macrantha* DC., but differing by having the *leaves* ovate, not lanceolate, stem strict, *heads* glomerate.

Patagon.; Chili, by Rio Maipu (33° 5).

N. pyramidalis arachnoidea O. Ktze.

Leaves and shoots webby, but the sterile stems glabrous.

Patagon., Lagos.

24. N. remeyana Wedd.

Leaves crowded, linear-subulate, gradually attenuate from a dilated base, laxly spinulose-dentate, pubescent or glabrate. *Heads* solitary,

terminal, 4 cm. long. *Pappus-setæ* linear, rather persisting. *Leaf-borders* armed with the sharp spines.

S. Patagon., by Hatcher in Cordilleras. (Also a specimen in Gray Herb.)

"Food of Rhea."

(*N. repens* d'Urv. = *N. serpens* d'Urv.)

25. NASSAUVIA REVOLUTA Gill.

(*Nassæa.*) Pubescent. *Leaves* ovate, revolute, spinulose-serrate, at length glabrate above; costæ numerous, impressed-parallel, round, contiguous. *Heads* in a roundish spike. *Pappus* 1-seriate, of linear pales.

(Fig. in Eng. & Prantl, iv, 5, p. 348, B.)

(Argentina); S. Patagon., at Cerro Toro (Nordenskj.).

26. N. ROSULATA Ball. (H. & A. sub *Acanthophyllum.*)

(*Strongyloma.*) Dwarf, cespitose, branching from the base. *Leaves* woolly; primary leaves broad-subulate, amplexicaul, spinescent; secondary very short and obtuse, concave, rosulate, densely covering the lower part of the stem. *Heads* subglomerate, the lateral shortly peduncled.

Beautiful plants, the secondary leaves forming *rosules* in the axils of the primaries, which they soon obliterate, so as entirely to clothe the old parts of the stem. "A stunted shrub." "It is used to make combs for the Indian women."

Patagon., by Puerto Deseado, and northward; Chubut.

27. N. SCLERANTHOIDES O. Hoffmann.

Low, branching shrub, the branches prostrate. *Leaves* imbricate, appressed-silky, from a short, broad, amplexicaul sheath, suddenly attenuate to a spreading, linear, entire limb, with thick edge and pungent tip. *Heads* solitary on ends of short axillary branches. *Involucral* scales, outer 3–4, short, ovate; inner longer and narrower; all appressed-silky, hyaline-edged and mucronate. *Flowers* 4–6. *Achenes* villous. *Pappus-pales* 3, white, caducous. (*Mastigophorus*, with habit of the section *Strongyloma.*)

Patagon., at Puerto Madryn (Dusén).

28. NASSAUVIA SERPENS d'Urv.

Stem suffruticose, 30–60 cm. high, creeping, sparingly branching. *Leaves* along its whole length imbricate, amplexicaul, broad-ovate, serrate, acute, suberect or recurved, coriaceous, parallel-striate, more or less silky. *Heads* 4–5-flowered, sessile at the leaf-like bracts, in a large, dense, ovate glomerule. *Achenes* glabrous. *Pappus-setæ* 4–5.

Falklands; "abundant in the streams of stones; sending its brittle stems, several fathoms long, down through the rocks to the underlying soil." S. and W. Patagon., in upper valley of Rio Aysen (Dusén).

29. N. SPINOSA Don.

(*Panargyrus.*) *Stem* fruticulose, ascending. *Branches* velvety. *Leaves* crowded at the base, distant upwards, oblong-lanceolate, pinnatifid, dentate, spinose, hoary-villous, becoming smooth. *Heads* racemed at the end of the branches, the lower a little distant and axillary, above crowded and shortly pedicelled. *Pappus* 1-seriate.

(Chili); Patagon., common by Rio Gallegos and Rio Sta. Cruz.

30. N. STRUTHIONUM (Phil. sub *Strongyloma*).

Low, cespitose shrub. *Leaves* of fertile branches sessile, imbricate, ovate-triangular, acute, coriaceous, apically recurved; those of the sterile branches form a cucullate base ending in a long spine. *Heads* terminal, solitary. *Pales* linear.

S. Patagon., by Lago Pinto; Fuegia, Punta Anegada. Favorite food of rhea.

31. N. SUAVEOLENS Willd.

Stem herbaceous, erect, simple. *Leaves* cuneate, ovate, coarsely and acutely incised, subspinescent at the apex, villous beneath. *Heads* in a terminal, ovate glomerulus; *bracts* villous, exceeding the heads.

S. Patagon.; Magellan; S. Fuegia to near Cape Horn.

32. N. SUBSPINOSA (Phil. sub *Panargyrus*).

Low, subcespitose herb, glabrous or arachnoid-silky. *Leaves* sessile, linear-lanceolate, pungent, armed at both margins with a spiny tooth. Floral leaves similar, but often entire. *Heads* crowned at tops of the branches. *Pappus* not plumose.

(Chili); Fuegia; S. Patagon., by Hatcher at head of Rio Chico.

33. NASSAUVIA ULICINA (Hook. f. sub *Trianthus*).

Woody, depressed, glabrous. *Leaves* subulate, pungent, spreading-recurved, imbricating and sheathing at the base. *Heads* solitary at the ends of the branches, about 3-flowered. *Involucral* scales few. *Achenes* villous. *Pappus* of 3–5 pales.

Patagon.

75. TRIPTILION Ruiz & Pav.

Annual or perennial, erect herbs, with rather small, 3–5 flowered heads in terminal corymbs, or occasionally solitary; flowers all hermaphrodite. *Involucre* ovoid or oblong, its scales few, acute, the inner 5 subequal and erect. *Receptacle* small, nearly naked. *Corollas* bilabiate. *Anthers* connate-tailed. *Achenes* obovoid, papillose. *Pappus* of 4–5 caducous pales. *Leaves* scattered, often spinose-toothed or pinnatifid. *Flowers* blue or white.

Species 7, Chili to Patagon. Differs from *Nassauvia* chiefly in habit.

TRIPTILION DUSENII O. Hoffm., n. sp. (Plate XXX, E.)[1]

Low, erect, slender, annual, branching from the base or upwards, hispid, with short hairs. *Leaves* small, appressed strigulose, sessile, with a broad base; oblong in outline, pinnately 5-cleft, with linear rachis, and short, subacute segments. Floral leaves lanceolate, entire. *Heads* crowded at ends of stem and branches, or solitary on the lower branches, pediceled, the upper sessile. *Involucral* scales oblong, acute, green, with white, hyaline margin, apically pubescent, about 5-nerved, subcarinate. *Flowers* slightly exsert. *Corolla* (dry) white; *pappus* snowy.

Plant, including the root, 6–7 cm. high. Largest leaves, 9 mm. long, inclusive of their dentiform segments, 2½ mm. broad, rachis 1½ mm. broad. *Heads* 6 mm., *involucre* 4 mm. high.

S. Chili; Los Angeles. Coll. Dusén, Jan. 29, 1896 (n. 214).

[1] TRIPTILION DUSENII O. Hoffm., n. sp.

Annua gracilis humilis erecta a basi vel superne ramosa, pilis brevibus hispida, foliis parvis appresse strigulosis, basi lata sessilibus, ambitu oblongis, pinnatim 5-fidis, rhachi lineari, segmentis brevibus acutis vel subobtusis, latitudine circiter quartam rhacheos partem æquantibus; foliis floralibus lanceolatis integris; capitulis ad apices caulis et ramorum glomeratis vel ad ramos inferiores solitariis, plus minus evidenter pedicellatis, superioribus sessilibus, involucri squamis oblongis acutis viridibus, margine albo-hyalino cinctis, apicem versum pubescentibus pluri- (ca. 5-) nerviis, nervo mediano crassiore subcarinatis, floribus paulum exsertis, corollis (e sicco) albis; pappo niveo.

Allied to *Tr. euphrasiodes* Bert., a species doubtfully pronounced perennial by De Candolle, and enumerated among the perennial forms by Philippi; but, according to the specimens in the Berlin Herbarium, annual. Its leaves, however, are petiolate, and more pinnately parted, and its lobes may be 12, as against 2 in our plant. *Tr. andinum* Phil., very similar in habit, is distinguished by the spinose bracts and leaf-segments.

76. STRONGYLOMOPSIS Speg.

Habit, head and flowers as *Nassauvia*, Sec. *Strongyloma;* but *pappus* none.

S. FUEGIANA Speg.

Perennial, loosely cespitose, the branches suberect, short. *Leaves* nearly isomorphous, elongate, linear-subulate, trigonous, acute. *Heads* sessile at ends of the branches, mostly solitary. *Involucral* scales usually 6-seriate, glabrous, the three outer small. *Flowers* 5, corollas bilabiate, white; *achenes* silky-pubescent.

Golfo de S. Sebastian, E. Fuegia. Stems woody, tortuose. Habit of *N.* (*Strong.*) *patagonica* Speg.

77. AMEGHINOA Speg.

(Allied to *Nassauvia.*) *Head* discoid, equal-flowered; *flowers* numerous, hermaphrodite, fertile. *Involucre* campanulate; its scales about 1-seriate, with a few outer and shorter additional. *Receptacle* naked, alveolate. *Corolla* bilabiate, the outer lip 3-toothed; the inner narrowly 2-toothed. *Anthers* with a scarious, lanceolate, inferior appendage, attenuate-petiolate, as long as itself, basi-sagittate, and produced in barbellate tails nearly as long. *Style-branches* short, terete, truncate. *Achenes* subturbinate, costate, truncate above. *Pappus-setæ* 1-seriate, denticulate.

A small shrub, with subcoriaceous, dentate or lobed, spinulose leaves. Heads partly corymbed at the tops of the branches, briefly peduncled or sessile. Corollas ochroleucous. Achenes puberulo-hispid.

Only one species, viz.:

A. PATAGONICA Speg.

Branching shrub, nearly 1 meter high. *Leaves* subsessile, broad-ovate, pinnately lobed; the lobes entire, spinulose-mucronate, more or less laxly

and minutely glandular-hispid. *Bracts* lanceolate, acute, carinate, dorsally glandular-pulverulent.

S. Patagon., by Rio Deseado.

78. LASIORRHIZA Lag. (1811. *Leucheria* Lag., same date, but without species. *Leuceria*, Auct. *Chabræa* DC., 1812.)

Heads homogamous, radiatiform, or flowers subequal. *Involucre* broad, its scales few-seriate, imbricate, lanceolate, herbaceous, the inner apically scarious. *Receptacle* naked or with few pales near its border. *Corollas* bilabiate. *Anthers* with long tails; *style-branches* truncate. *Pappus-setæ* 1-seriate, united at base. Achenes obovoid or oblong, papillose or finely villous, the ribs not prominent.

Herbs more or less woolly. *Leaves* often radical. Heads mid-sized and panicled, or larger and solitary on scapes, purple or pink to white. (The Patagonian forms have the heads usually solitary.)

Species 60, in Andes and extratrop. parts of S. Amer. to Patagon., Fuegia and Falklands.

KEY TO THE SPECIES.

A. Stems developed.
- *b*. Subglabrous, branching. Leaves bipinnatifid, segments linear; upper leaves simpler. Heads long-stalked. *anthemidifolia*.
- *b*2. Sparsely hairy. Leaves pinnatipartite, the upper sessile segments rounded. Heads large. *suaveolens*.
- *b*3. Woolly.
  - *c*. Stem simple.
    - *d*. Leaves bipinnatifid; segments ovate. *achillæifolia*.
    - *d*2. Cauline leaves broad-lanceolate. *gossypina*.
    - *d*3. Stems many from a rhizome. Lower leaves linear or broader. Flowers red. *hahnii*.
    - *d*4. Stems many scapiform. Leaves lyrate to spatulate, toothed, etc. Heads small; flowers white. *gracilis*.
  - *c*2. Stems low.
    - *d*. Cauline leaves linear, bipinnatifid. Flowers white. *ibari*.
    - *d*2. Leaves pinnatifid-incised to spatulate. Bract half-way on the scape. Flowers white to pink. *lanata*.
    - *d*3. Branches crowded, leafy. Leaves ovate, cleft. Head subsessile. *leontopodiodes*.
    - *d*4. Stems leafy. Leaves pinnatisect; segments 4 pairs, short; the lower leaves smaller. Peduncles solitary. Flowers yellow-red. *lanigera*.
- *b*4. Leaves tomentose underneath, pinnatifid, auricled, semiamplexicaul. *stricta*.

*A*2. Stemless. Woolly.
- *b*. Leaves lanceolate-linear, entire. *patagonica*.
- *b*2. Leaves some pinnatifid, mostly oblanceolate, entire. Flowers pink. *fuegina*.

*b*3. Leaves pinnatifid.
c. Lobes 5 pairs, entire, with a terminal 3-lobed. *candidissima.*
*c*2. Lobes 6–8, imbricate. Scapes in pairs. Flowers dark-purple. *hoffmanni.*
*b*4. Leaves pinnatisect; segments 7 pairs, 3-lobed. Flowers purple. *purpurea.*
*b*5. Woolly and green. Leaves pinnatisect, the lobes 3-lobed, decussate-imbricate. Flowers white to pink. *scrobiculata.*

1. LASIORRHIZA ACHILLÆIFOLIA (Hook. & Arn., sub *Leuceria*).

Stem slender, 15–20 cm. high, dichotomously branching, puberulous. *Leaves* remote, bipinnatifid, the segments small, ovate, obtuse, their axils and rachis rather woolly. *Involucre* campanulate, its scales linear-oblong, obtuse, tuberulous. *Ligules* oblong.

Patagon., at Puerto Deseado.

2. L. ANTHEMIDIFOLIA (Phil., sub. *Leuceria*) O. Ktze.

Low perennial to 25 cm. high, branching from the base, rather glabrous, glandular. *Leaves* of linear outline, bipinnatifid, the segments linear, entire or incised, acute. Lowest leaves long petioled, the upper sessile and gradually simpler, lastly linear bracts. *Heads* with rather long peduncles; *involucral* scales dorsally and apically glandular; the inner with scarious sides.

Patagon., near Lago Pinto.

3. L. CANDIDISSIMA (Gill. & Don., sub. *Leuceria*).

Stemless, with snowy wool. *Leaves* incised pinnatifid; the lobes, 5 pairs, ovate-oblong, acute, entire, and a terminal 3-lobed part. *Scape* nearly naked, 1-headed.

(Chili; Argent.); S. Patagon., by head of Rio Chico (J. B. Hatcher, Feb. 9, 1897); Fuegia. (Fuegian specimens are lower, with fewer lobes of leaves and less deeply cut; often like *L. hahni*, having some entire radical leaves. Speg.)

4. L. FUEGINA (DC., sub *Chabræa*) O. Ktze.

Stemless, arachnoid-woolly. *Leaves* erect, the lowest pinnatifid, but most oblanceolate, attenuate to a long petiole, entire. *Peduncles* radical, nearly leafless, 1-headed. *Involucral* scales rather obtuse. *Ligules* pink. Near *L. candidissima*).

(Chili); Patagon.; E. and N. Fuegia; Magellan (Dusén).

5. LASORRHIZA GOSSYPINA (H. & A., sub *Leuceria*).

Densely woolly. *Stem* simple, leafy, 1-flowered. Radical leaves? *Cauline leaves* very broad-lanceolate, acuminate, rather naked upwards. *Involucre* campanulate, its scales oblong-lanceolate, obtuse, nearly as long as the flowers. Ligules oblong.

Falklands.

6. L. GRACILIS (Alboff, sub *Leuceria*). (DC., sub *Chabræa.*)

Green, 16–30 cm. high, with many stems, slender, scapiform, having 1–3 narrow, linear bracts, or bractless, sparsely woolly or hairy. *Leaves* slender, membranaceous, lyrate or spatulate, entire or sparingly toothed, or pinnately incised or partite. *Heads* rather small, slender, with white flowers.

Fuegia, valley of Olivaia on Beagle Channel.

7. L. HAHNII (Franchet, sub *Leuceria*).

Rhizome thick, many-stemmed, covered by black remains of leaves. Plant white-woolly. *Stems*, 30 cm. high, 1-headed, nearly naked above. *Floral leaves* linear or oblong-spatulate, attenuate-petiolate, petiole widening below. *Head* 20 mm. in diameter. *Involucral* scales 2-seriate, outer obtuse, inner acutish. *Receptacle* naked. *Flowers* bilabiate, subequal, bright red. *Achenes* scabrid. *Pappus* of white barbellate hairs, rufous at tip.

Fuegia, Beagle Channel, at Lapataia and Ushuaia; S. Patagon., at head of Rio Chico (Hatcher, Feb. 11).

8. L. HOFFMANNI (Dusén, sub *Leuceria*).

Low, 4–5 cm., woolly. *Leaves* radical, rosulate, pinnatifid; their segments 6–8, oblong, elliptical, imbricate, the uppermost at least incised; sheaths exceeding the laminæ, 5–7-striate, woolly-margined. *Scapes* in pairs, as long as the leaves, 1-headed, with 1–2 linear leaves. *Heads* hemispherical. *Bracts* 2-seriate, acute, 3-nerved, woolly on the outside. *Rays* black-purple, linear, cochleate-revolute. *Achene* papillous. *Pappus* snow-white.

S. Patagon., Cerro-peliki, to 500 m. of elevation. (O. Nordenskjöld.)

9. LASIORRHIZA IBARI (Phil., sub *Leuceria*).

Perennial, with low *stem*, corymbosely branching, base and petioles white-woolly. *Basal leaves?* Cauline leaves, linear in outline, bipinnatifid, the lower semiamplexicaul. *Heads* very shortly pediceled. *Involucral* scales, gland-puberulous, purplish at margins. *Corollas* white.

S. Patagon., at Rio Sta. Cruz; Chubut.

10. L. LANATA (Alboff, sub *Leuceria*).

Low, 8–12 cm., woolly, very variable. *Leaves* varying as to woolliness, deeply pinnatifid-incised, or pinnatifid, or lyrate, or spatulate. *Scape* low, white, with a linear bract half-way up. *Ligules* exceeding the involucre, white to deep pink.

Fuegia, heights above Ushuaia.

Allied to *L. purpurea*, and *L. candidissima*, and *L. fuegina;* all may form a single species.

11. L. LANIGERA (O. Hoffmann, sub *Leuceria*).

Low, 7 cm., woolly, bearing few, short, leafy stems. *Cauline* leaves pinnatipartite, segments 4 pairs, short-elliptical, entire (or the upper incised), imbricate, the sheath longer than the lamina, many-striate, webby; lower leaves with smaller lamina. *Peduncles* solitary, as long as the leaves. *Heads* mid-size, with yellow-red, linear-oblong rays. *Involucre* hemispherical, its scales 1–2-seriate, oblong, acute, the outer webby, nerves 3, dark. Achenes granulate. *Pappus* snow-white.

S. Patagon., Cerro-paliki, at 450 m. elevation (O. Nordenskjöld).

12. L. LEONTOPODIOIDES O. Ktze.

Perennial, low, 15 cm., woolly, with crowded, leafy branches. *Leaves* hidden in wool, with lamina 5 mm. long, ovate, 6–8-cleft; petiole 25 mm., its base sheathing. *Head* solitary, terminal, subsessile, campanulate, 10 mm. high by 15 mm. broad. *Involucral* scales 2-seriate, lanceolate. *Flowers* bilabiate, the outer ligulate. *Achenes* narrow-turbinate, verrucose. *Receptacle* naked. *Pappus-setæ* many.

S. Patagon., at Cerro Toro.

13. L. PATAGONICA (Speg. sub *Leuceria*).

Stemless. *Leaves* all radical, rosulate, lance-linear, entire, subacute, densely webby and white-woolly. *Scape* woolly, exceeding the leaves;

simply 1-headed. *Involucre* 1–2-seriate. Ray-flowers exceeding the disk, with no chaff between the outer flowers.

S. Patagon., by Lago Argentino; E. Fuegia (Dusén).

14. LASORRHIZA PURPUREA (DC. sub *Chabræa;* H. & A. sub *Leuceria*).

Stemless, with woolly base, scape and petioles. *Leaves* pinnatisect, their segments about 7 pairs, distant, 3-lobed. *Scape* 1-headed. *Ray* of ligulate purple flowers.

N. and E. Fuegia, Magellan., Patagon., by Hatcher in valley of Rio Sta. Cruz, January 16. "Chiefly in the steppe-region." (See *L. lanata.*)

15. L. SCROBICULATA (DC. sub *Chabræa*).

Stemless, green and woolly. *Leaves* deeply pinnatifid, their lobes 3-lobulated, decussate-imbricate. *Scape* nearly naked, 1-headed; it and involucre laxly woolly. *Flowers* nearly white to deep pink.

(Chili); S. Patagon., in valley of Rio Sta. Cruz, 100 miles (160 km.) above its mouth.

16. L. STRICTA (Phil. sub *Leuceria.*)

Perennial; stem strict, hirtellous, with very short, glandular hairs. *Leaves* above green, subglabrous, underneath webby-tomentose and hoary; radical leaves . . .; lower, cauline leaves oblong-linear in outline, pinnatifid, with narrow segments, long-acuminate, entire or few-toothed, basally much narrowed, with small, semi-amplexicaul auricles; auricle of upper leaves broader than the rest of the leaf, generally orbicular and spiny-toothed; uppermost leaves minute, consisting of a very broad auricle and a tip. Branches of *corymb* 1–2-flowered. *Involucral* scales very lax, 12 mm. long, their apex glabrous. *Ligules* blue (?), with their tube 15 mm. long. *Head* broad, 28 mm. diam.

W. Patagon., by Rio Palena; corymbs with 10–12 heads. Chubut, "My specimens have more heads in the corymb, the heads smaller and the stems thicker; approaching *L. magna* (?)," Speg.

17. L. SUAVEOLENS (DC. sub *Chabræa*).

Very woolly. *Stem* simple, leafy, 1-headed. *Leaves* pinnately parted, the lower petiolate, the upper sessile and semi-amplexicaul; their lobes subrotund, entire. *Heads* large, 35 mm. in diameter, long-rayed. Involu-

Fig. 106.

Lasiorrhiza (*Chabræa*) *suaveolens.*— Flower-head, and one of the flowers. (From *Flora antarctica.*)

cral scales sublinear, immersed in wool, which abounds at top of the thickened scape. (Fig. 106.)

Falklands; ornamental on grassy hills, and fragrant.

79. PEREZIA Lag.

Acaulescent, cespitose, or caulescent, rarely shrubby; with entire or pinnatifid *leaves*, their margins often ciliate-spinose. *Heads* homogamous, mostly many-flowered, moderate-sized, sometimes rather large and solitary on a leafless, bracteolate, scape-like peduncle, or panicled, rarely clustered on axillary branches. *Involucre* 2–many-seriate, its scales imbricating. *Flowers* pink to purple, white or blue (not yellow), the outer lip longer both in the head and in the homochromous ray. *Style-branches* truncate, with terminal hairs. *Receptacle* plane, naked or pilose. *Fruit* not beaked, papillose or hairy. *Pappus* setose, several-seriate. (Section *Clarionæa*, with glabrous receptacle; and section *Homoianthus*, with hairy-fimbrilliferous receptacle.)

Species 75, from Arizona and Texas to Patagon.; most in the Andes, a few in S. Brazil.

Key to the Species.

A. Erect. Stem or its branches 1-headed.

b. Glabrous.

c. Leaves lanceolate, entire, petiolate. The cauline sessile, cordate-sagittate. *lactucoides.*

*c*2. Leaves linear, with marginal spines; the upper sparse, erect. *linearis.*

*c*3. Leaves pinnatisect, lobes spiny-tipped. Cauline linear, and spiny. *lechleri.*

*b*2. Pubescent upwards. Leaves chiefly basal, pinnatisect, the segments mucronate. Head nodding, blue. *pedicularifolia.*

*A*2. Erect; heads few. Leaves pinnatipartite; lobes ovate. Involucre scales short. *brachylepis.*

*A*3. Ascending. Leaves sessile. Flowers blue.

b. Leaves linear, entire, apically white-mucronate. Scapes with broad leaves. *patagonica.*

*b*2. Leaves broad-linear, recurved, with marginal spines. Peduncle nearly naked. *recurvata.*

*A*4. Cespitose perennial, glabrous, with wool on the petioles. Leaves narrow-linear, entire. Heads sessile amid the upper leaves, white. *sessiliflora.*

*A*5. Glandular. Stems scapiform.
b. Leaves spatulate, toothed. Scape 1–2-leaved. Head rather large, lilac. *megalantha*.
*b*2. Basal leaves pectinate, sessile. Scape with a broad bract and others smaller. Flowers pink. *oleracea*.
*b*3. Basal leaves pinnatipartite, the lobes entire, spiniferous. Outer flowers long-radiant. *magellanica*.

*A*6. Dwarf, chiefly glabrous.
b. Leaves subulate, rigid, pungent; the axils woolly. *lanigera*.
*b*2. Leaves pinnatisect, rigid; lobes spiny-tipped; petiole and involucral scales setiferous. Flowers blue. *pilifera*.
*b*3. Subfruticose. Leaves oval, acute, sessile, spiny-toothed. Heads terminal, crowded. *pygmæa*.

1. PEREZIA BRACHYLEPIS Phil.

Stem erect, few-leaved, with few *heads*, scarcely scabrous. *Leaves* thin, the basal pinnatipartite, lobes ovate, broadly adnate at their base, sinuate-dentate. Cauline leaves auricled-amplexicaul, gradually becoming simpler. *Involucral* scales rather short, linear, rounded-acute.

Valdivian Andes. Plant 60 cm. high, the involucre only 11 mm. Chubut Mts. "Here with scales of the involucre slightly pubescent." (Speg.).

2. P. LACTUCOIDES Less. (*Homoianthus magellanicus* DC.)

Glabrous, with simple, erect, leafy stem, 1-headed; to 60 cm. high. *Leaves* entire, radical ones petiolate, lanceolate; cauline semiamplexicaul, cordate-sagittate, oblong-lanceolate. *Involucral* scales 3-seriate, laxly imbricate, ovate, acuminate, their margin finely denticulate, fimbriate.

S. Patagon., at Cabo Negro; Magellan; E. and S. Fuegia. (Dusén.) "Two plants of different sizes are included in this; except however in size I am unable to distinguish them." (J. D. Hooker.)

3. P. LANIGERA Hook. & Arn.

Dwarf, nearly stemless, scarcely 25 mm. high, cespitose. *Leaves* exceeding the stem, subulate, rigid, pungent, the margin revolute, glabrous, entire, their base dilated-amplexicaul; their axils woolly. *Involucral* scales oblong, mucronate, all entire.

S. Patagon., by Puerto Deseado.

4. P. LECHLERI (Sch. Bip., sub *Clarionæa*) Phil.

Elegant, glabrous perennial, 3–5 cm. high, having a rhizome with long fibres, the basal *leaves* rosulate, very numerous, pinnatisect, their lobes

oblong-lanceolate, entire or 1-toothed, ending in a whitish, strong spine. Petiole broad, ciliate. *Stems* 1–4, 1-headed, scarcely exceeding the leaves, bearing linear, ciliate-spinose leaves. *Heads* showy. *Involucre* hemispherical; its scales oblong-lanceolate, greenish-blue, margins scarious-white, apex pungent, yet snowy. *Receptacle* small, naked. *Achenes* silky. *Pappus* sordid.

Magellan, Punta Arenas.

5. Perezia linearis Less.

Stem erect, simple, 1-headed, or with many-leaved, 1-headed branches. *Leaves* coriaceous, linear, acute, glabrous, rigidly and equally ciliate on margin; the lowest crowding, spreading; the upper sparse, erect. *Involucral* scales 3–4-seriate, imbricate, the outer ones rigidly and regularly ciliate, as are the leaves, the innermost marginally ciliate.

(S. Chili, on ground amidst rocks on the mountains); W. Patagon., in upper valley of Rio Aysen, and N. Patagon., by Lago Nahuel-huapi (Dusén); Chubut, amid dry, hilly rocks.

6. P. magellanica (Linn. f.) Lag. (DC. sub *Clarionæa.*)

Radical *leaves*, pinnately parted, the parts entire, ciliolate, ovate, the terminal subrotund. *Stem* scapiform, 2–3-leaved, pilose-glandular, with solitary, terminal head. *Involucral* scales 2-seriate, the outer short, spreading. *Outer flowers* long-radiant.

W. Patagon.; E. and W. Magellan; Fuegia to Cape Horn; Staaten I.

7. P. megalantha Speg.

(*Clarionæa.*) Stemless, glandular-hispid. Rootstock branching. Radical *leaves* 30–40 mm. long, spatulate, toothed. *Scape* much exceeding the leaves, 1–2-leaved, simply 1-headed. *Head* hemispherical-campanulate, rather large. *Involucral* scales several-seriate, membranaceous, pubescent. *Corolla* lilac.

S. Patagon., by Lago Argentino; Valley of Rio Gallegos.

8. P. oleracea O. Ktze.

Glandular-hairy. *Radical-leaves* rosulate, pectinate, sessile, 5 by 2 cm. *Scape* 10 cm. high, bearing a cordate-ovate acute bract remote from the solitary, terminal *head*, and 2–3 broader, smaller, more lacerate, approximate bracts. *Head* very large, 3 cm. broad, 4 cm. high. *Involucral*

scales not spinose, several-seriate, the outer green, lacerate, broader than long, the inner narrowing. *Flowers* pink, all bilabiate, outer lip larger, 3-toothed, inner much smaller, 2-parted. *Achenes* young, silky, strigose. *Pappus-setæ* numerous, yellow, scabrid, 15 mm. long. ("Involucre as in *Cirsium oleraceum*.")

Patagon (M. & T.).

9. PEREZIA PATAGONICA Speg.

(*Homoianthus.*) Cespitose-effuse, prostrate-ascending, 1–6 cm. high. *Leaves* imbricate, linear, amplexicaul, thick, entire, revolute, white-mucronate apically. *Scapes* erect, long, with 3–5 ovate-cordate leaves, marginally uncinate-ciliolate. *Head* solitary, campanulate, outer *involucral* scales like the leaves of the scape, recurved-denticulate; inner scales lanceolate, straight, acute, spinescent. *Flowers* blue.

Patagon., by Golfo de San Jorge; on maritime dunes near mouth of Rio Sta. Cruz.

10. P. PEDICULARIÆFOLIA Less.

Rhizome thick. *Stem* simple, striate, 10 cm. high, pubescent upwards, 1-*headed*. *Leaves* crowded at base, few upwards, pinnatisect, segments and teeth mucronate. Head nodding. *Involucre* turbinate-campanulate; its scales few-seriate, shorter than the flowers, acuminate. *Corolla* blue, outer lips oblong-elliptical. *Pappus* yellow. *Achenes* yellow-villous.

(Chili); Patagon.?

11. P. PILIFERA (Don. sub *Clarionæa*).

Stem short, 3–5 cm., 1-*headed*. *Leaves* subradical, pinnatisect, glabrous, rigid, the lobes lanceolate, undivided or 2-lobed, ending in a long seta, petiole broad, bristly ciliate. *Involucre* cylindrical, its scales scarious-margined, produced into a seta, the outer spreading. *Flowers* blue.

(Chili); S. Patagon.; Fuegia, passim; heights above Ushuaia; "chiefly in the steppe-region and with *Azorella glebaria*." (Dusén.)

12. P. PYGMÆA (Cass. sub *Triachne*) Hook. f.

Small, 5 cm. high, subwoody. *Leaves* sessile, imbricate, oval, acute, coriaceous, at base toothed-ciliate, apically recurved. *Heads* terminal, crowded; *involucre-scales* numerous, mucronate.

Fuegia, on mountain-top, near Blossom Bay.

13. PEREZIA RECURVATA (Vahl) Less. (*Homoianthus echinulatus* Cass.) (Plate XXIX.)

Stem ascending, glabrous, densely leafy, the *leaves* semi-amplexicaul, broad-linear, recurved, with spines beneath. *Peduncle* nearly naked, or with scattered bracts, 1-*headed*. *Involucral* scales 3-seriate, the outer spinulose-toothed. *Flowers* light blue. To 30 cm. high, the peduncle being half of this, or shorter. (Fruit scarcely hairy, but finely papillose. G. M.)

(Chili; Argentina); Patagon., by Hatcher at Cabo Negro and in the Cordilleras; Fuegia, on Beagle Channel, and passim; Navarin I.; Magellan; Falklands.

"One of the most interesting plants of the Falkland Islands, from the very sweet scent of its large, pale-blue flowers, which have been compared to Jessamine and the Violets. It generally grows near the sea in rocky places." (J. D. Hooker.)

14. P. SESSILIFLORA Speg.

(*Homoianthus.*) Cespitose perennial. *Branches* short, imbricating, leafy. *Leaves* glabrous, narrow-linear, not spreading, sessile, dilated into a periclad, with long, cottony wool underneath, scarcely mucronulate, margin revolute, entire. *Heads* solitary, sessile amid the upper leaves. *Involucral* scales ovate-lanceolate, spinulose-mucronulate. *Flowers* 10–12, white.

Patagon., by Golfo de San Jorge; Rio Deseado; Rio Sta. Cruz; in upper valley of Rio Gallegos (Nordenskj.).

80. HYPOCHŒRIS Linn.

Usually perennial herbs, with scapose, often branching stems, and basal *leaves*, pinnatifid to entire; the scapes with few, small leaves or none. *Heads* mostly large, long-peduncled. *Flowers* yellow. *Involucral* bracts many-seriate, appressed. *Receptacle* chaffy. *Anthers* sagittate. *Style-branches* obtusish. *Achenes* 10-ribbed, more or less beaked. *Pappus* plumose.

Species 50, Eurasia and S. Amer.; 1 naturalized in N. Amer. (Sec. *Achyrophorus*, once deemed a genus, having a seriate pappus, includes most of the S. American forms.)

KEY TO THE SPECIES.

A. Stem leafy, 1-headed. Leaves fleshy, subentire. Involucre-scales lanceolate, acute. *brasiliensis.*

A2. Stem branching. Leaves long-lanceolate, pinnatifid.

b. Involucral scales linear, blackish. *apargioides.*

b2. Outer involucral scales obtuse, reddish. *tenerifolia.*

A3. Stem simple, 1-headed. Leaves mostly radical; also bract-like, cauline leaves.

b. Radical leaves short, acute, entire. Involucral scales black, woolly. *palustris.*

b2. Radical leaves sublanceolate to pinnatifid.

c. Involucre campanulate. Scape tall. *arenaria.*

c2. Involucral scales obtuse, woolly. Head largish. *philippii.*

A4. Stem simple, 1-headed. Leaves radical.

b. Leaves narrow-linear, subentire.

c. Involucral scales large, mealy at base. *hookeri.*

c2. Involucral scales webby, setose. Stem villous. *ibari.*

b2. Leaves narrow-linear, pungent, pinnatifid, golden. *incana.*

b3. Leaves long-linear, glabrous. Flowers white. *leucantha.*

b4. Leaves lanceolate, sinuate-dentate. Head large. *odorata.*

b5. Leaves linear. Involucral scales linear-lanceolate, rough. *coronopifolia.*

b6. Leaves grass-like, filiform to broad-linear, sometimes pinnatifid. Involucral scales acuminate, webby. *tenuifolia.*

1. HYPOCHŒRIS APARGIOIDES (Less.) Gris.

Stem branching, glabrous or subhispid; branches rough under the heads. *Leaves* radical, hispidulous, long-lanceolate, pinnatifid; their lobes acuminate or obtuse, the uppermost linear, entire. *Involucral* scales blackish, hispidulous, linear, obtuse or subacuminate.

(Chili): N. Patagon., near Rawson, at mouth of Rio Chubut; S. Patagon.

A form with the outer involucral scales broader, and the leaves less divided, is found in Chili, and by Buenos Ayres, and may be in N. Patagon.

2. H. ARENARIA Gaud.

Sparingly hispid, or smooth; root long, its neck 1–3 parted. *Leaves* radical linear-obovate, lanceolate, long-petiolate, obtuse or acuminate, sinuate-dentate or pinnatifid. *Scape* exceeding the leaves, naked or with 1–2 minute leaves, with 1 terminal *head*. *Involucre* campanulate, its scales tomentose to glabrate, the outer sparsely hispid-pilose.

(Chili); S. Patagon., in valley of Rio Baguales (Nordenskj.), Cabo Negro (Hatcher): Magellan: Falklands; S. Fuegia, by Ushuaia, "rather glabrous with leaves oboval-lanceolate, entire, or runcinate-pinnatifid,

dentate or incised." (Alboff.) At Killikaike, Rio Gallegos (Barnum Brown); style-branches large, clavate, dark-brown in this (G. M.).

3. HYPOCHŒRIS BRASILIENSIS Griseb. (*Achyrophorus chondrilloides* Gray.)

Glaucescent, glabrous, root fusiform. *Stem* leafy, strict, 1-headed. *Peduncles* elongated. *Leaves* fleshy, linear-lanceolate, entire or obsoletely toothed; the upper subamplexicaul. *Involucral* scales lanceolate, acute.

N. Patagon., by Rio Negro.

4. H. CORONOPIFOLIA (Sch. Bip. sub *Achyrophorus*, 1855).

Root cylindric. *Stem* exceeding the leaves, squamose, glabrous or with sparing, fugacious, white toment, 1-headed. *Leaves* radical, linear, subdentate, glabrous to tomentose. *Involucral* scales imbricate, linear-lanceolate, hispid underneath. *Flowers* golden. *Achenes* nearly beakless. A small bract midway on the stem.

S. Patagon., by Hatcher; S. Fuegia, at Lapataia on Beagle Chan. Magellan (specimen in Gray Herb., along with another specimen from Golden-gate Park, Calif.). Identification verified by Prof. B. L. Robinson of the Gray Herbarium.

("This and *H. tenuifolia* are mere varieties of *H. variegata* of Baker." Speg.) *H. variegata* Sch. Bip., 1859, of Argentina, is a synonym. See *H. tenuifolia*.

5. H. HOOKERI Phil.

Webby. *Leaves* glabrous, radical, erect, as long as the 1-headed scape, narrowly linear, entire or with a few setiform teeth. *Involucral* scales large, mealy tomentose at base; the inner narrow, acuminate.

(Chili); Patagon. (M. & T.)

6. H. IBARI Ph. (*Achyrophorus*).

Stem solitary, 1-*headed*, villous, leafless. *Leaves* narrow-linear, entire or few-toothed. *Involucral* scales densely webby, dorsally setose, black-green, acuminate. *Pales* broad at base, somewhat toothed, and then narrow.

S. Patagon., by Rio Sta. Cruz; Magellan.

7. HYPOCHŒRIS INCANA Hook & Arn. (*Achyrophorus*).

Hoary, with deciduous tomentum. The golden radical *leaves* narrowly linear, subulate-pungent, pinnatifid. *Scape* lēafless, 1-headed.

(S. Amer. at San Julian); S. Patagon., by Rio Gallegos; and Rio Sta. Cruz.

8. H. LEUCANTHA (Speg. sub *Achyrophorus*).

Leaves all radical, long-linear, 12–24 mm. long, acute, attenuate below, 1-nerved, entire, glabrous. Scapes simple, 1-headed, exceeding the leaves, glabrous below, white webby above, with few prickles. *Head* campanulate. *Involucral* scales lance-linear, narrow, obtuse, white-webby on the margin, dorsally obscure, green, 1-nerved, costate with prickles in the costa. *Corolla* white; *anthers* rose-white. *Style-branches* connivent, exsert, black-purple.

Patagon., by Golfo de San Jorge; Rio Chubut.

9. H. MAGELLANICA (Schultz, sub *Achyrophorus*).

(Perhaps a variety of *H. tenuifolia*.)

10. H. ODORATA (Walp. sub *Achyrophorus*.)

Stem solitary, simple, leafless, setose-hispid. *Leaves* lanceolate, sinuate-dentate, both sides smooth, villous at the mid-rib, margin scabrid. *Head* large. *Involucre* with outer scales, setose-hispid, gradually shorter, imbricate. *Pappus* plumose, having about 20 equal, with or without intermediate shorter, setæ.

(Chili), Patagon. (?)

11. H. PALUSTRIS (Phil. sub *Achyrophorus*).

Glabrous. Stem erect, simple, 1-*headed*, nearly leafless. *Radical leaves* short, acute, gradually attenuate below, subsessile, entire. *Cauline* leaves linear-subulate, crowded under the involucre, which is blackish, woolly ciliate externally, scarcely hispidulous on the back of the scales. *Achenes* shortly rostrate. *Pales* of receptacle long, with long awns.

N. Patagon., by Valdivia; N. Fuegia. (Dusén.)

12. H. PHILIPPII O. Ktze. (*H. grandiflora* Phil., non Led.)

Root simple. *Leaves* chiefly rosulate, glabrous or sometimes ciliate, linear-lanceolate, and entire, or oblong, or pinnatifid, with obtuse seg-

ments. *Scape* little exceeding the subulate leaves, webby above, 1-*headed*. *Involucral* scales moderately large, numerous, oblong-linear, obtuse, basally floccose, truncate, without setæ. *Ligules* twice as long. Fruit? (Argentina.)

HYPOCHŒRIS PHILIPPII GLABRESCENS O. Ktze.

Involucral scales broader, glabrescent, the lower ovate.

Patagon (M. & T.).

13. H. TENERIFOLIA. (Remy, sub *Achyrophorus*.)

Stem nearly simple, over 30 cm., glabrous, except at the apex. *Radical leaves* of lance-linear outline, attenuate to a long petiole, weak, pinnatifid, with narrow, oblique lobes; cauline subentire. *Involucral* outer scales obtuse, pilose with reddish exterior; inner membranaceous-margined. Valdivia; Chiloe; S. Fuegia (Dusén).

14. H. TENUIFOLIA (DC. Prodr. sub *Achyrophorus*, 1838) Gris.

Glabrous or subarachnoid. *Stem* simple. *Leaves* grass-like, radical, filiform to linear-lanceolate, entire or sinuate, or pinnatifid, segments linear. *Scape* 1-headed. *Involucre* ovate-campanulate; its scales linear to linear-lanceolate, acuminate, webby and basally hispid. Variable.

S. Patagon., Magellan; Elizabeth I. (See note under *H. coronopifolia*. Accepting Spegazzini's view, we have *H. tenuifolia* DC. as the species, with varieties *coronopifolia* and *variegata*.)

81. TARAXACUM Hall. (1768. Linn. sub *Leontodon* 1753.)

Herbs, with milky juice and radical, toothed to runcinate-pinnatifid leaves. *Scapes* leafless, with 1, rarely 2–3 heads, which are midsize to large, yellow. *Involucre* campanulate to oblong, with 1-seriate, erect scales (changing in fruit), and several-seriate, shorter outer scales, usually recurved. *Achenes* oblong, 4–5-angled, apically muricate and rostrate, supporting the copious, slender, capillary *pappus*.

Species 40, in north-temperate and cold climate; few in south-temperate, rarely in the tropics. (Fig. of fruit in Eng. & Prantl, iv, 5, p. 367, D.)

1. T. IBARI Phil.

Glabrous, with runcinate *leaves* (narrower than of *T. taraxacum*). *Scape* scarcely exceeding the leaves. *Scales* of involucre imbricate, all appressed,

the outer ovate-lanceolate, acuminate; the inner broad-white, scarious. *Achenes* strongly ribbed, costæ spinulose at apex. *Rostrum* as long as the achene.

Magellan, at Rio Blanco.

2. TARAXACUM MAGELLANICUM Comm.

Petioles slender, elongated. *Leaves* rounded apically. *Involucral* scales all erect, the outer white-red, scariously margined.

(Argentine pampas); Magellan, by Punta Arenas.

3. T. TARAXACUM (L. sub *Leontodon*) Karst. (*T. officinale* Web.; *T. dens-leonis* Desf.) Dandelion.

Root thick, deep. *Leaves* in outline oblong to spatulate, pubescent when young, irregularly pinnatifid or sinuate-toothed, rather succulent, narrowed to the petiole. *Scape* erect. *Head* solitary, 25–50 mm. broad; flowers golden. *Outer involucre* reflexed. *Achenes* muricate at top, narrowing to the long, filiform *rostrum*.

(Eurasia and N. Amer.) Patagon., Magellan (Dusén); Fuegia; Falklands (introduced).

4. T. TARAXACUM LÆVIGATUM (W. sub *Leontodon*) O. Ktze.

Glabrous. *Leaves* runcinate-pinnatipartite, lobes unequal, lanceolate, acuminate, subdentate. *Involucral* scales subcorniculate, callous-tipped, the outer spreading. *Achenes* pale, with *rostrum* longer than in the type.

(Eurasia, in meadows and dry pastures); Patagon.; Magellan; Fuegia, passim, alpine about Ushuaia; Falklands.

5. T. TARAXACUM ALPINUM (Koch.) Porter.

Outer *involucral* scales spreading, ovate or narrower. *Leaves* very deeply parted. *Achenes* pale brown.

(Europe; Labrador; and by Rockies and Calif. southwards.) S. Patagon., by Hatcher at Coy Inlet and Punta Arenas.

82. SONCHUS Linn.

Succulent herbs, with milky juice and alternate, mostly auriculate, amplexicaul *leaves*, entire or toothed, or lobed, and prickly-margined. *Heads* large or midsize, corymbose, yellow. *Involucre* ovoid to cam-

panulate, its scales many-seriate, imbricated, smaller outwards. *Receptacle* naked. *Anthers* basisagittate. *Achenes* flattish, 10–20-costate, truncate. *Pappus* copious, white, capillary, usually deciduous together.

Species 5, of Old World.

1. SONCHUS ASPER (L.) Allioni.

Annual. *Stem* leafy below. *Leaves* undivided or pinnatifid, spinulose-toothed; the lower petiolate, the upper clasping, with rounded auricles; obovate to oblong or lanceolate. *Achenes* ribbed, but not transversely wrinkled.

Cosmopolitan. N. and S. Patagon.; "naturalized and spread over tropical and temperate South America; probably to a great extent without the agency of man." (J. Ball.)

2. S. OLERACEUS Linn. Sow-thistle.

Basal and lower *leaves* petioled, lyrate-pinnatifid, 10–25 cm. long, the terminal segments usually large and triangular. Upper leaves pinnatifid, with acute, clasping auricles. *Achenes* ribbed, and transversely wrinkled.

Patagon. (M. & T.; by Hatcher on edge of a marsh, nearly a meter high, in fruit March). A weed in cultivated lands of the Old World and N. Amer.; also naturalized in Patagon. and the Chonos Archip.

83. AGOSERIS Raf. (*Troximon* Nutt., 1813, non Gaertn., 1791. Including *Macrorhynchus* Less.)

Nearly stemless herbs, glabrous to sparsely pilose. *Scapes* erect, leafless, 1-headed. *Heads* midsize to large, liguliferous, mostly yellow. *Involucre* campanulate, its scales many-seriate, the outer smaller. *Receptacle* rarely with some chaff. *Anthers* basally acute or setaceous. *Achenes* glabrous, 10-costate, contracted below, apically rostrate. *Pappus* setose, copious.

Species 25, in W. and S., of N. Amer., and Peraustral Amer.

1. A. AUSTRALIS (Phil. sub *Macrorhynchus*).

Cespitose. *Leaves* arachnoid-hirsute, linear, usually pectinately pinnatifid; with linear segments and linear rachis. *Scapes* scarcely exceeding the leaves, very densely woolly. Outer *involucral* scales hirsute, triangular-lanceolate; inner glabrous and longer, equalling the flowers.

Magellan strait, near Punta Arenas; Falklands.

2. AGOSERIS GLAUCA (Nutt. sub *Troximon*).

Stout, 50–60 cm. tall; pale or glaucous, glabrous or loosely hairy. *Leaves* linear to lanceolate, entire, sometimes dentate or laciniate. *Heads* many-flowered. *Involucral* scales lanceolate or broader, with external shorter scales, often hairy or villous. *Achenes* with beak 10–12 mm. long, exceeding the pappus, which is copious, of stiff, denticulately scabrous setæ.

(Western U. S.); Patagon., Magellan, Fuegia.

3. A. PTEROCARPA (Fisch. & Mey.) (sub *Macrorhynchus*).

Leaves varying, entire, toothed, or usually pinnatifid; always somewhat villous. *Scape* mostly 2–3 times longer than the leaves. *Involucral* scales, outer subsquarrose, villous, white, hirsute. *Achenes* winged, costate, shorter than the rostrum.

(Chili, annual); Patagon., Chubut; E. Fuegia (Dusén).

3. A. PUMILA (DC. sub *Macrorhynchus*).

Sparsely hirsute, with white villosity. *Leaves* narrowly-linear, entire, sinuate, or runcinate-pinnatifid. *Scape* exceeding the leaves. *Involucral* scales linear-lanceolate, leafy, externally glandular-hispid.

S. Patagon.; Magellan; Fuegia, by the Beagle Channel; Falklands, on grassy places by the sea.

84. HIERACIUM Linn. Hawkweed.

Perennials, with double *indumentum*, glandular and stellate, or glabrous; and yellow to reddish *heads* on leafless scapes. *Involucre* of equal, narrow scales, usually also with outer calyculus. *Receptacle* naked. *Achenes* oblong, 10–15-costate, contracted at base, truncate above. *Pappus* of copious setæ, 1–2-seriate, simple, fragile, sordid.

Species 400, in Eurasia, N. Amer., N. and S. Afr., the Orient, Japan and the Andes. (The most difficult of Old World genera.)

KEY TO THE SPECIES.

A. Stem branching.

b. Leaves oblong-spatulate, subentire, with long hairs, and glands. Heads 8–18, small, 1 cm. *chilense.*

b2. Leaves obovate-lanceolate, apiculate. Heads 2–4, small; pubescence mixed. *philippii.*

b3. Leaves oblong-lanceolate. Heads 6 8. Involucral scales linear, with black hairs. *patagonicum.*

*b*4. Leaves oblanceolate, and 1–2 cauline narrow.
c. Heads sulphur-colored. Involucre hirsute, its scales acuminate. *magellanicum.*
*c*2. Heads mediocre. Involucral scales linear, hoary. *chubutense.*
*A*2. Scape simple, 1-headed. Leaves oblong to spatulate. Plant all pubescent. *pilosella.*
*A*3. Scape 1-headed, sometimes also a small second. Leaves oblong-spatulate, few-lobed; and some linear on scape. Achenes smooth. *antarcticum.*
*A*4. Stem few-leaved, 1–4-headed. Radical leaves obovate to spatulate, smooth. Involucre with black wool. *triste.*

1. HIERACIUM ANTARCTICUM d'Urv.

Pubescent. *Scape* slender, 10 cm. high, with few, linear *leaves*, and a solitary *head*, less than 1 cm. high, and still narrower, occasionally with a second, smaller head. Calyculus none. *Basal leaves* oblong-spatulate, with few, obscure lobes near the base, obtuse or acutish, nearly glabrate. *Achenes* oblong, truncate, smooth, flattened. *Pappus* unequal.

S. Patagon., by Cape Fairweather; by Hatcher in the Cordilleras, on damp ground; S. Fuegia, alpine (Nordenskj.); Falklands.

2. H. CHILENSE Less.

Stems 30 cm. high, spreading-hirsute, erect, paniculately branching, 8–18-flowered, the branches short, divaricate. *Leaves* oblong-spatulate, briefly attenuate-petioled, obtuse, entire or few-toothed, with long, rigid hairs on both surfaces. Cauline leaves few, narrowing upwards. *Hairs* long, rigid, white, with a black base, having clavate glands between. *Heads* small, 1 cm.

(Chili); Fuegia, Navarin I.

3. H. CHUBUTENSE Speg.

Leaves mostly all radical, oblanceolate, entire, with long, scaberulous, white or rufescent hairs. *Stem* arising from center of leaves, erect, substriate, remotely 1–2-leaved, glabrous; above the middle, laxly corymbose, the branchlets bracteolate and subdichotomous. *Pedicels* 1-headed, hoary. *Heads* erect, mediocre. *Involucral* scales about 1-seriate, linear, dorsally hoary, slightly shorter than the disk.

Chubut, amid grassy rocks at Teka-choique.

4. H. MAGELLANICUM C. H. Schultz.

Perennial, over 20 cm. high, with basal leaves. *Stem* a span high, scapiform, hirsute; with 1–2 bracts, narrowly linear, 2 cm. long. *Leaves* rosular, 10 cm. by 12 mm., oblanceolate, sinuate-dentate, or entire, gla-

brescent. *Corymb* lax, to 40 cm. long, tomentose-hirsute. *Involucre* campanulate, hirsute, its scales acuminate. *Flowers* sulphur-colored. *Pappus* sordid.

Magellan, near the lignite-mine (perhaps the same with *H. antarcticum*).

5. HIERACIUM PATAGONICUM Hook. f.

Rough, with spreading hairs. Stolons none. *Radical leaves* oblong-lanceolate, subacute, narrowing to a petiole; cauline leaves few, sessile, narrower, obscurely and remotely toothed. *Stem* scapiform, paniculately branching, bearing 6–8 heads. *Involucral* scales linear, subsetose, with rigid, black, spreading hairs.

Patagon., Golfo de San Jorge; by Cape Fairweather; Fuegia.

6. H. PHILIPPII Alboff.

Stems numerous, 20 cm. high, *pubescence* mixed, long, simple hairs and glandular; with 3–5 setaceous bracts, branching above, having 2–4 heads on slender peduncles. *Leaves* radical, obovate-lanceolate, attenuate-petiolate, apiculate at the apex and margins, with sessile glands on both surfaces; 1 or 2 of the leaves narrow-linear. *Heads* small. *Pappus* sordid. (Near *H. magellanicum*.)

Fuegia, Navarin I.; Falklands.

7. H. PILOSELLA Linn.

Pilose-pubescent and stoloniferous. *Scape* slender, erect, with 1 large, yellow head, 3 cm. in diameter. *Leaves* oblong to spatulate, entire, obtuse or acutish, attenuate-petiolate, 5 cm. by 12 mm. *Involucre* pubescent. *Achenes* oblong.

(Europe; naturalized in N. Amer.); S. Patagon., by Hatcher in Cordilleras, on damp ground; Feb. 15, 1897.

8. H. TRISTE Willd.

About 15 cm. high. *Stem* simple, few-leaved, racemose, with 1–4, yellow heads. *No stellate hairs* and no glands. Radical *leaves* obovate to spatulate, entire, green; glabrate or nearly so; upper leaves oblong to linear, with the stems villous. *Heads* 1 cm. high and broad. *Involucre* and peduncle with blackish wool. *Achenes* short, columnar. *Pappus* fuscous.

(Bering's Strait and Aleutian Is.); S. Patagon., by Hatcher in the Cordilleras.

PART VI.

ANALYSIS OF THE ORDERS AND FAMILIES OF THE FLOWERING PLANTS OF PATAGONIA.

The Flowering Plants differ from the Pteridophytes by an advanced development of the microsporangia into stamens bearing pollen, and of the megasporangia into ovules which become embryo-bearing seeds. They contain two chief classes, the antique one called the *Gymnospermia*, having pteridophytic affinities; and the modern class, known as the *Angiospermia*, because of their seed being in true seed-vessels, with stigmas.

The superclass of Angiosperms is itself composed of two classes—the *Monoctyledones*, and the *Dicotyledones*, the latter being the larger. And each of these classes contains a considerable number of Plant families; of which according to Engler and Prantl, there are 280, namely 4 families in the *Gymnosperms*, 43 families in the *Monocotyledones*, and 233 families in the *Dicotyledones*. When a family is named from one of its leading genera, which is usually the case, its name has *-aceæ* for termination; as from *Lilium*, the family *Liliaceæ*. Alliances of natural families are known by the terminal *-ales* as *Liliales*. These are becoming known as *Orders*.

It is found convenient to break up the large Class of Dicotyledones into a few subclasses, each of them containing many orders and families. The character of the perianth, whether absent or, if present, whether its petals are distinct from each other or coalesce, and whether the perianth is superior, or inferior, or perigynous, relatively to the inner organs of the flower, are of chief importance here. But we may expect exceptional cases, which render the classification necessarily artificial. It must also be remembered that a natural system is not serial; that even if we knew all the interrelations of the families it should be necessary to arrange them not in line but in space, like the ramifications of a tree. In the system here adopted we begin a large group with the simplest forms among its

components, and end with the most complex. There are some irreducible cases of families whose natural affinities are unknown, as Euphorbiaceæ, and Polygalaceæ.

The Patagonian region contains representatives of about 113 natural families, of which the Dicotyledones have 92, and the Monocotyledones about 17 families, whilst there are 4 families of Gymnosperms.

THE ORDERS AND FAMILIES.

Subkingdom SPERMATOPHYTA = Phanerogamia, or Flowering-plants (*Embryophyta siphonogama* Engler), having pollen and producing seeds with embryo.

A. Superclass *GYMNOSPERMIA* (families 1–4), pp. 140–145. Trees or shrubs with diclinous flowers, the carpels not forming a closed ovary nor bearing a stigma.

b. Branching freely; the wood consisting of tracheids, without ducts (saving resiniferous ducts), forming annual rings and bark. Flowers mostly in staminate and pistillate cones, without perianth. (CONIFERÆ, p. 140.)

c. Leaves in spirals. Cones many-carpellary, dry. Seed 1 in each carpel, inverted. Family 1. *Araucaria* of *Pinaceæ*, p. 140.

*c*2. Leaves in whorls of 2–4. Cones woody or fleshy, few- (1–4)- carpeled. Seeds often several in each carpel, erect. Stamens with 3–5 pollen sacs, the pollen wingless. Family 2. *Cupressaceæ*, p. 141.

*c*3. Leaves acicular or broader, rarely opposite. Cones often fleshy, few-carpeled, carpels 1-seeded. Stamens with 2 pollen sacs, the pollen winged. Family 3. *Podocarpeæ* of *Taxaceæ*, p. 142.

*b*2. Branching or with simple stem; jointed and with ducts in the wood. Leaves reduced to scales. Flowers with a small perianth. Seeds fleshy, grape-like. (GNETALES.) Family 4. *Ephedraceæ*, p. 144.

AA. Superclass *ANGIOSPERMIA.* Trees, shrubs or herbs, having fibrovascular bundles; the flowers varying as to sexuality and perianth; the carpels forming a normally closed, stigmatiferous ovary.[1] Families 5–113, p. 146–906.

B. Class MONOCOTYLEDONES or Endogens. Having stem endogenous; leaves usually parallel-veined, non-stipulate; flowers normally 3-merous; embryo with 1 cotyledon. Families 5–21, pp. 146–324.

C. (*Acyclicæ.*) Flowers with the parts spirally arranged, showing little structural symmetry.

d. Perianth none, or consisting of bristles or scales.

e. (*Pandanales.*) Perianth of hypogynous bristles. Stamens 1–∞; carpels 1–∞,

[1] *Terms explained: Acrandrous*, having staminate flowers uppermost; *acrogynous*, having pistillate flowers uppermost; *eudiplostemonous*, having the outer stamens antisepalous; *obdiplostemonous*, having the outer stamens antipetalous. *Tepaliferous* families are such as have double perianth of *tepals*, not differentiated into petals and sepals, but all similar. The tepals may be colored or green or dry scales like chaff. *Sepalo-petalous* flowers have a double perianth consisting of differentiated sepals and petals.

not united, usually stipitate. Seeds endospermous. Tall marsh-plants, with linear leaves, and monœcious flowers in terminal, acrandrous spikes.
Family 5. *Typhaceæ*, Cat-tail, p. 146.

e2. (*Arales.*) Perianth none, or scales. Flowers monœcious on a spadix, mostly enclosed by a spathe.

f. Land-plants with sympodial stems, or basal leaves; these mostly large and reticulate. Fruit a berry. Family 12. *Araceæ*, p. 289.

f2. Minute, stemless, floating plants, in fresh water. Stamen 1.
Family 13. *Lemnaceæ*, Duckweed, p. 290.

e3. (*Helobiales* p. p.). Aquatic or marsh plants, with sepaloid or reduced perianth, and seeds with no endosperm.

f. Perianth of 4 leaflets, or none, or a cup. Plants submerged or floating.
Family 6. *Potamogetonaceæ*, Pondweed, p. 147.

f2. Perianth 2-seriate, hypogynous. Carpels partially united. Flowers in an erect raceme or spike. Leaves radical, rush-like.
Family 7. *Juncaginaceæ*, p. 150.

d2. Perianth 2-seriate, the inner petaloid. (*Helobiales* p. p.) Aquatic plants. Seeds with no endosperm.

e. Perianth 3 + 3; petals white, showy. Flowers panicled or racemed, hypogynous, the carpels not united. Leaves long-petioled.
Family 8. *Alismaceæ*, Water-plantain, p. 152.

e2. Flowers dicœcious and syncarpous; the females solitary on long, coiling scapes. Leaves long, grass-like, floating in quiet waters.
Family 9. *Vallisneriaceæ*, Tape-grass, p. 153.

d4. (*Glumales.*) Flowers mostly without perianth, but with dry glumes, hypogynous, monocarpellary, 1-seeded. Seeds with large endosperm.

e. Usually hermaphrodite. Stems terete, normally hollow and jointed. Leaves narrow, 2-ranked, with split sheaths. Flowers in spikelets, the pericarp adhering to the seed. Embryo at base of, and external to the endosperm.
Family 10. *Gramineæ*, Grasses, p. 154.

e2. Mostly monœcious. Stem normally trigonal, solid, with narrow, 3-ranked leaves, having closed sheaths. Pericarp not adhering to the seed. Embryo enclosed in the endosperm. Family 11. *Cyperaceæ*, Sedges, p. 256.

CC. (*Eucyclicæ.*) Families with normally 5-cyclic flowers; the whorls generally isomerous, mostly trimerous, rarely pluri- or di-merous. Sometimes with tepals instead of differentiated sepals and petals. Rarely tetra-cyclic, there being only one staminal whorl.

d. (*Farinales.*) Flowers 3–2-merous, with formula t3–t3, st3–st3, syncarpels 3. The stamens may be 1-seriate, or only 1. Seeds orthotropous or curved. Endosperm mealy.

e. Mostly dicœcious, with glume-like perianth. Herbage and spikelets of *Cyperaceæ*, but leaf-sheaths split. Family 14. *Restionaceæ*, p. 292.

e2. Hermaphrodite; with spikelets having 1–3 glumes. Stamens 1–2, with 1 anther. Ovary 1–3-celled; cells 1-seeded.
Family 15. *Centrolepidaceæ*, p. 292.

*e*3. Hermaphrodite. Perianth sepalo-petalous, and epigynous. Stamens 6. Ovary 3-celled; style 3-lobed; seeds numerous. Epiphytes with scurfy leaves. *Tillandsia* of Family 16. *Bromeliaceæ*, p. 293.

*d*2. (*Liliales.*) As *Farinales*, but with mostly anatropous seeds, and fleshy, or cartilaginous, or oily endosperm. Chiefly herbs, with 3-merous flowers, and 2-seriate tepalous perianth.

e. Hypogynous, at least usually.

f. Perianth-leaves glume-like. Stamens 6 or 3.
Family 17. *Juncaceæ*, Rushes, p. 295.

*f*2. Perianth-leaves usually large and petaloid. Stamens 6.
Family 18. *Liliaceæ*, Lily, p. 303.

*e*2. Epigynous. Perianth usually petaloid.

f. Style simple, or rarely 3-lobed. Stamens 6, on base of perianth.
Family 19. *Amaryllidaceæ*, p. 309.

*f*2. Style 3-cleft, its branches often flattened and petaloid. Stamens 3, on base of outer tepals. Family 20. *Iridaceæ*, p. 312.

*d*3. (*Orchidales.*) Typically 3-merous and 4-cyclic; stamens 1, rarely 2, connate with the stigma. Perianth 2-seriate, both series petaloid, but differentiated; the inner being very zygomorphic, and its posterior becoming its anterior from the torsion of the long inferior 1-(rarely 3-) celled ovary. Seeds very many and very minute, without endosperm.
Family 21. *Orchidaceæ*, Orchid, p. 320.

BB. Class DICOTYLEDONES or Exogens. Having stem exogenous; leaves reticulately veined, stipulate or estipulate; flowers normally 5–4-merous, rarely 3–2-merous; embryo with 2 cotyledons. Families 22–113, pp. 325–906.

C. Subclass APETALÆ. Including families with naked or with monochlamydeous flowers; a few are petaliferous, but with simple perianth. Families 22–31, pp. 325–354.

d. (*Salicales.*) Flowers naked, diœcious, with cup-like or tooth-like disk. Stamens 2–∞. Carpels 2, united. Ovary 1-celled, with 2 parietal placentæ, and many anatropous seeds, these having hairy plumes and no endosperm. Woody plants, with simple, alternate, mostly stipulate leaves.
Family 22. *Salicaceæ*, Willow, p. 325.

*d*2. Flowers cyclic, rarely naked. Stamens mostly opposite the perianth-leaves.

e. (*Fagales.*) Trees with alternate, stipulate leaves, and spicate, usually monœcious flowers. Male catkins globose. Carpels 2–6, connate; seeds few, with no endosperm. Fruit burr-like. Family 23. *Fagaceæ*, Beech, p. 325.

*e*2. (*Urticales.*) Herbs or woody, with alternate or opposite, stipulate leaves, and flowers small, clustered, 4-(2–5-) merous, often monœcious. No catkins. Filaments reflexed. Carpels 2–1, becoming a 1-seeded nut. Seeds mostly with oily endosperm. Family 24. *Urticaceæ*, Nettle, p. 330.

*d*3. Perianth cyclic, bract-like or petaloid, rarely differentiated into calyx and corolla. Flowers hermaphrodite or diclinous.

e. (*Proteales.*) Flowers usually 2–4-merous, the stamens hypogynously opposite and adnate to the petaloid segments, only the anthers free. Carpel 1; seed mostly 1. Chiefly woody plants, with alternate, estipulate leaves.
Family 25. *Proteaceæ*, p. 333.

e2. (*Santalales.*) Perianth green or petaloid. Stamens as many as the perianth-segments, or twice as many. Ovary 1-celled, superior or inferior; seeds few, often imbedded in the placenta; with large endosperm. Plants usually more or less parasitical.

f. Leaves green, estipulate. Seed solitary.

g. Leaves mostly opposite. Flowers moncœcious or dicœcious. Ovary 1-celled, 1-ovuled, immersed; fruit a berry. Parasitic shrubs.
Family 26. *Loranthaceæ*, Mistletoe, p. 335.

g2. Leaves alternate or opposite. Flowers hermaphrodite. Calyx 4–5-cleft, its tube adnate to the 1-celled ovary. Ovules 2–5. Style cylindric. Semi-parasitic.
Family 28. *Santalaceæ*, Sandalwood, p. 338.

f2. Leafy or leafless. Flowers dicœcious; the males naked, 2–3-staminate; the females with 3-parted calyx, adnate to the 3-seeded ovary. Fruit 1-seeded, trigonal, with 3 feathery plumes on the angles. Tree-parasites.
Family 27. *Myzodendraceæ*, Angel's beard, p. 336.

f3. Leafless, fungus-like parasites, only the top of the large solitary flower visible above ground. Stamens 3 (–5), with 3 staminodes. Ovary inferior; fruit baccate. Family 30. *Hydnoraceæ*, p. 344.

d4. Perianth double, the calyx minute, or none. Trees or shrubs with alternate, estipulate leaves, and perfect flowers. Stamens 1–3-seriate. Ovary 4-celled; the cells 1-seeded. Fruit a drupe. Family 29. *Olacaceæ*, p. 344.

d5. (*Polygonales.*) Flowers cyclic or subspiral, radiate, with a 3-merous tendency. Ovary 1-celled, with 1, mostly orthotropous, ovule. Flowers usually small, in compound inflorescences. Leaves mostly with an ochrea.
Family 31. *Polygonaceæ*, Buckwheat, p. 345.

CC. Subclass CHORIPETALÆ or Mesochlamydeæ. Flowers mostly hermaphrodite, the perianth usually sepalo-petalous (*i. e.*, differentiated into calyx and corolla); the leaves of the corolla being distinct petals and usually colored. In a few genera the petals are wanting, and then the sepals are petaloid.
(Families 32–82), p. 354–643.

d. Alliances with single bracteoid or petaloid perianth; yet often sepalo-petalous.

e. (*Centrospermales.*) Flowers spiral or cyclic, small and crowded, tepalous or sepalo-petalous, hypogynous. Stamens often isomerous with, and opposite to the perianth-leaves, yet varying from many to 1. Carpels 1 to many, mostly syncarpous. Ovary rarely pluri-celled, mostly 1-celled, with 1–∞-curved seeds. Embryo mostly curved around endosperm. Chiefly herbs.

f. Tepalous, bract-like, perianth.

g. Flowers greenish; bracts, if any, not scarious. Styles 1–2. Utricle rarely circumscissile, mostly indehiscent.
Family 32. *Chenopodiaceæ*, Goosefoot, p. 354.

g2. Flowers green or white, with scarious bracts and 2 bractlets. Utricles mostly circumscissile. Family 33. *Amarantaceæ*, Amaranth, p. 372.

f2. Petalous, symphyllous perianth, usually with a calyx-like involucre. Style 1; fruit an anthocarp.
Family 34. *Nyctaginaceæ*, Marvel of Peru, p. 376.

*f*3. Tepalous or sepalo-petalous, perigynous. Outer perianth 3–5-merous; inner often of numerous, small petals or none. Prostrate herbs, with opposite or whorled leaves, and scarious stipules.

Family 35. *Aizoaceæ*, Carpet-weed, p. 377.

*f*4. Sepalo-petalous. Sepals mostly 2. Petals and stamens 4–5. Placenta basal. Fleshy herbs; leaves often opposite, sometimes stipulate.

Family 36. *Portulacaceæ*, Purslane, p. 378.

*f*5. Sepalo-petalous, or rarely apetalous. Flowers 5–4-merous, mostly diplostemonous; sometimes 2–5-staminate. Ovary mostly 1-celled, with 2–5 styles and central placenta. Herbs, with opposite, entire, normally estipulate leaves. Some small forms have scarious stipules, apetalous flowers, and achenial fruit. Family 37. *Caryophyllaceæ*, Pink, p. 382.

*d*2. Alliances with mostly sepalo-petalous perianth.

c. Apocarpy and hypogyny prevail. Seeds with endosperm.

f. (*Ranales*.) Flowers spiral to cyclic, tepalous to sepalo-petalous, epigynous to hypogynous, radiate to zygomorphic, mostly with many stamens. Carpels ∞–1, mostly free, rarely united. Herbs, or woody.

g. Perianth single, many-parted. Flowers monœcious. Stamens numerous. Carpel 1, with one suspended ovule. Erect aquatic, with whorled, dissected leaves.

Family 38. *Ceratophyllaceæ*, Hornwort, p. 398.

*g*2. Spiral to cyclic; perianth single or sepalo-petalous. Carpels usually separate. No stipules.

h. Leaves often much divided; and mostly alternate. Flowers radiate or zygomorphic, or apetalous. Mostly herbs.

Family 39. *Ranunculaceæ*, Crowfoot, p. 398.

*h*2. Carpels numerous, 1-seeded, in an accrescent, fleshy cup. Aromatic trees or shrubs, with opposite leaves.

Family 42. *Monimiaceæ*, p. 420.

*g*3. Spirocyclic, 3-merous flowers, many-seriate perianth, and many stamens and achenes on a long, floral axis. Trees with simple, alternate leaves, and fugacious, thin stipules.

Family 41. *Magnoliaceæ*, p. 419.

*g*4. Cyclic, mostly. Flowers often 3-merous, sepals and petals each 2-seriate. Stamens often equal and opposite the petals, and anthers often with uplifted valves. Carpel 1, with parietal placenta. Fruit baccate. Shrubs, with simple or pinnate, often spinose leaves.

Family 40. *Berberidaceæ*, Barberry, p. 415.

*c*2. Syncarpy and hypogyny prevail.

f. (*Rhœadales*.) Flowers cyclic (not always the stamens), sepalo-petalous, rarely apetalous, hypogynous, radiate or zygomorphic. Carpels ∞–2, united. Mostly herbs, flowers often racemed.

g. Flowers 2-merous (zygomorphic in the Subfamily, which has 6 diadelphous stamens, and a globular nutlet). Sepals 2, fugacious. Petals 4. Seeds with endosperm. Herbs with colored juice.

Fumitory subfamily of Family 43. *Papaveraceæ*, Poppy, p. 421.

g2. Endosperm none. Leaves mostly alternate, and estipulate.

h. Sepals and petals 4. Stamens 6, tetradynamous, or fewer by abortion. Carpels 2, united, with a false septum. Radicle folded on cotyledons. Family 44. *Cruciferæ*, Mustard, p. 421.

h2. Flowers 5-merous, radiate. Stamens 6 to many, not tetradynamous. Ovary mostly 1-celled.

Family 45. *Capparidaceæ*, Caper, p. 454.

h3. Flowers spirocyclic, unsymmetrically 4–7-merous, small, in racemes or spikes. Capsule 3–6-lobed, 1-celled, opening prematurely at apex, with parietal placentæ. Small herbs, with glands for stipules. Family 46. *Resedaceæ*, Mignonette, p. 454.

f2. (*Sarraceniales.*) Flowers spirocyclic to cyclic, sepalo-petalous, hypogynous, radiate, 5-(–4-) merous. Stamens 5 (4–20); ovary 1–3-celled. Marsh-herbs with basal leaves having viscid hairs, insectivorous.

Family 47. *Droseraceæ*, Sundew, p. 455.

e3. Perigyny common; but apocarpy and hypogyny still occur. Immersion of the gynecium in the floral axis often induces syncarpy and epigyny of perianth and stamens. (*Rosales.*) Flowers cyclic, rarely spirocyclic, sepalo-petalous or rarely apetalous, hypogynous to epigynous, radiate or zygomorphic. Carpels often free, or sometimes united, occasionally with thick placentæ, and many-seeded.

f. Seeds usually with endosperm.

g. Flowers completely isomerous (or occasionally diplostemonous). Sepals partly united. Seeds small, with scanty endosperm. Fleshy herbs, with simple, alternate, estipulate leaves.

Family 48. *Crassulaceæ*, Stonecrop, p. 456.

g2. Diplostemonous. Leaves opposite or whorled, stipulate. Petals smaller than sepals or none. Shrubs or trees, with small flowers in heads or racemes. Family 50. *Cunoniaceæ*, p. 466.

g3. Normally diplostemonous. Leaves mostly alternate, estipulate. Petals normal, mostly half-epigynous. Carpels few, often 2, united, with diverging beaks. Herbs or shrubs. Seeds endospermous.

Family 49. *Saxifragaceæ*, p. 457.

f2. Seeds mostly without endosperm. Leaves alternate, stipulate. Flowers 5-merous.

g. Carpels ∞–1, buried in the receptacle, or mounted on a disk, or in a pome. Flowers regular; stamens numerous, often perigynous.

Family 51. *Rosaceæ*, Rose, p. 467.

g2. Carpel usually a single legume. Flowers mostly papilionaceous, with 10 stamens, or subpapilionaceous, or regular with many stamens. Odd sepal anterior. Family 52. *Leguminosæ*, Pea, p. 485.

e4. Flowers usually with 5–4 cycles. Apocarpy and isomerism occur; but syncarpy and oligomery of gynecium prevail; pliomery of this is rare. Stamens often 10 or fewer.

f. (*Geraniales.*) Flowers cyclic, sepalo-petalous or apetalous, rarely entirely naked, normally 5-merous. Carpels 5–2, rarely more, united, but often

separating at maturity, each with 2–1 seeds. Seed epitropous, with ventral raphe, and superior micropyle; a second, if present, has dorsal raphe and inferior micropyle.

g. Sepalo-petalous, often obdiplostemonous, rarely isostemonous. Anthers with lateral slits. Carpels isomerous or oligomerous.

h. Capsule ultimately separating into 5 carpels on the elongated axis. Stamens 10. Styles branching. Leaves lobed or divided. Family 53. *Geraniaceæ*, Geranium, p. 531.

*h*2. Capsule 2–5-celled, not separating. Diplo- or triplo-stemonous. Styles distinct or branching. Leaves mostly radical, palmately 3-parted, or many-parted. Family 54. *Oxalidaceæ*, p. 536.

*h*3. Capsule 3-celled, ultimately splitting apart. Perianth showy, zygomorphic, with a spur. Stamens 8; style 1. Leaves peltate or palmatifid. Family 55. *Tropæolaceæ*, p. 543.

*h*4. Capsule 4–12-celled. Flowers regular, 5- rarely 4-merous, diplo- or triplo-stemonous. Mostly shrubs, with opposite, pinnate, stipulate leaves. Family 56. *Zygophyllaceæ*, p. 544.

*e*5. Anomalous families. Seeds mostly with endosperm. (The following three families are of unknown affinities.)

*f*2. Flowers zygomorphic, with 2 staminal whorls; anthers opening by pores. Carpels 2, united. Petals 3(–5), united into a tube, dorsally open and often crested. Sepals 5, the lateral pair becoming large wings. Endosperm present or wanting. Family 57. *Polygalaceæ*, Milkwort, p. 546.

*f*2. Flowers regular, mostly apetalous, monœcious or diœcious. Ovary mostly tricoccous; the ripe cocci often elastically springing from the axis. Embryo large, in fleshy or oily endosperm. Herbs or shrubs with milky juice, sometimes spinose. Family 58. *Euphorbiaceæ*, p. 551.

*f*3. Small, aquatic herbs, with opposite, entire leaves, and minute, solitary flowers, sessile in the axils. Stamen 1; ovary 4-celled, with 2 styles. Family 59. *Callitrichaceæ*, Water Starwort, p. 556.

*e*6. (*Sapindales*, including *Celastrales*.) Like *Geraniales*, but having the seeds turned round, so as to be either pendent with dorsal raphe and superior micropyle, or ascending, with ventral raphe and inferior micropyle. Chiefly woody plants.

f. Flowers sepalo-petalous, radiate, monœcious or diœcious. Petals 3; stamens 3. Gynecium iso- or plio-merous. Drupes black or red, with 6–9 nutlets. Heath-like evergreens. Family 60. *Empetraceæ*, Crowberry, p. 557.

*f*2. Stamens 10; ovary 5- or 10-lobed, 5-styled, becoming 1-seeded cocci. Shrubs with opposite or 3-whorled, estipulate leaves. Family 61. *Coriariaceæ*, p. 557.

*f*3. Sepalo-petalous or apetalous, radiate, small flowers. Gynecium tending to oligomery. Stamens on a disk.

g. Leaves with resin-ducts. Flowers 3–7-merous, polygamous to hermaphrodite. Fruit a small drupe; cells 1-seeded. Endosperm scanty or none. Family 62. *Anacardiaceæ*, Sumach, p. 558.

*g*2. No resin-ducts. Flowers 4–5-merous, mostly hermaphrodite. Ovary 3–5-celled; style 3–5-lobed. Seeds with aril and endosperm. Leaves pinnately veined. Family 63. *Celastraceæ*, Staff-tree, p. 559.

*g*3. (*Rhamnales.*) Cyclic, sepalo-petalous or sometimes apetalous, perigynous. Stamens as many as and opposite to the petals. Carpels 5–2, united, and more or less inferior; cells mostly 1-ovulate. Seeds with endosperm, having dorsal, lateral or ventral raphe. Shrubs, with simple, stipulate leaves, often thorny.

Family 64. *Rhamnaceæ*, Buckthorn, p. 561.

*g*4. (*Malvales.*) Flowers cyclic (not always the stamens), sepalo-petalous, rarely apetalous, radiate, rarely zygomorphic. Calyx 5-merous, valvate. Petals 5. Stamens usually numerous. Carpels 2–∞ united, each with 1–∞ anatropous ovules. Leaves stipulate.

h. Anthers 2-celled, opening by pores. Petals often many-lobed or wanting. Drupe with pyrenes. Trees or shrubs with entire, non-resinous leaves. Family 65. *Elæocarpaceæ*, p. 567.

*h*2. Anthers 1-celled; pollen prickly. Stamens monadelphous. Leaves alternate, often with stellate hairs. Calyx often with a calyculus.

Family 66. *Malvaceæ*, Mallow, p. 568.

*e*5. (*Parietales.*) Spirocyclic or cyclic, often with ∞ stamens and ∞ carpels; sepalo-petalous, rarely apetalous; hypogynous to epigynous. Sepals free or slightly united. Carpels united; placentæ often parietal, occasionally central or basal.

f. Gynecium free on a convex axis.

g. Carpels 5–18, united, but the styles distinct. Flowers 4-merous, the sepals apically connate. Stamens numerous. Evergreen tree, with opposite leaves and connate stipules. Seeds winged. Endosperm.

Family 67. *Eucryphiaceæ*, p. 577.

*g*2. Carpels mostly 3, united, the styles distinct. Stamens in 3 clusters. Leaves opposite or whorled, with pellucid dots, estipulate. Seeds without endosperm.

Family 68. *Hypericaceæ*, St. John's wort, p. 578.

*g*3. Flowers 4–7-merous; petals mostly appendaged at the claws; stamens in two series of 3; anthers versatile. Placentæ parietal; seeds with endosperm. Herbs or undershrubs with decussate leaves.

Family 69. *Frankeniaceæ*, p. 578.

*g*4. Carpels 3, united, 1-celled, 1-styled, with parietal placentæ. Perianth zygomorphic, 5-merous, 1 petal usually spurred. Anthers 5, connate, 2 of them spurred. Leaves simple, alternate, stipulate. Scapes 2-bracted, 1-flowered. Herbs.

Family 70. *Violaceæ*, Violet, p. 580.

*g*5. Petals without ligulæ (no petals in the Patagonian species). Stamens ∞, on a disk. Placentæ 3–5, parietal; styles as many. Evergreen shrubs with 2-ranked leaves. Family 71. *Flacourtiaceæ*, p. 584.

*f*2. Gynecium mostly elevated on a gynophore, with a crown of radials at its base. Stamens few, inserted with the perianth perigynously. Ovary

1-celled with parietal placentæ. Styles 3–5, clavate. Fruit a berry. Leaves often lobed, with axillary tendrils.

Family 72. *Passifloraceæ*, Passion-flower, p. 584.

*f*3. Gynecium immersed in the axis, and united with it, 1-celled. Flowers mostly yellow. Stamens many. Placentæ parietal or superior. Leaves often compound. Family 73. *Loasaceæ*, p. 585.

*c*6. (*Opuntiales.*) Flowers hemicyclic, sepalo-petalous, with spirally arranged sepals, petals, and stamens, on the tubular axis, and 4–∞ carpels forming an inferior gynecium. Succulent plants, usually leafless and spiniferous.

Family 74. *Cactaceæ*, Cactus, p. 591.

*c*7. Flowers cyclic; the gynecium commonly sunk in the hollow floral axis, and often connate with the floral axis or the receptacle. Stipules usually none.

f. (*Myrtales.*) Flowers sepalo-petalous or apetalous, iso- or diplo-stemonous (sometimes more by fission); rarely zygomorphic; axis hollow, with 2–∞ carpels united in a free or adnate gynecium.

g. Seeds usually numerous, without endosperm.

h. Flowers perigynous; ovary more or less free, 2–6-celled. Stamens 1–3 times the petals. Bicollateral bundles.

Family 76. *Lythraceæ*, Loosestrife, p. 599.

*h*2. Epigynous. Stamens numerous. Style 1. Shrubs or trees, with opposite leaves, having oil-glands.

Family 77. *Myrtaceæ*, Myrtle, p. 601.

*h*3. Flowers epigynous, 4–5-merous. Stamens few, often 2-seriate. Herbs or shrubs with simple, non-glandular leaves, opposite or alternate. Family 78. *Onagraceæ*, Evening-primrose, p. 606.

*g*2. Perigynous; tending to apetaly. Seed mostly 1, pendulous, without endosperm, but with 2 integuments. Stamens about 8, in 2 series. Trees or shrubs, with rough, inner bark.

Family 75. *Thymeleaceæ*, Mezereon, p. 597.

*g*3. Seeds with endosperm, solitary in the carpel, and with only 1 integument. Flowers epigynous, sometimes diclinous. Stamens 4–8, or 1–2. Amphibious plants with alternate or whorled leaves, and small, greenish flowers. Family 79. *Haloragidaceæ*, Water-milfoil, p. 615.

*f*2. (*Umbellales.*) Flowers cyclic, sepalo-petalous, mostly isostemonous, epigynous, 5–4-merous, mostly hermaphrodite, radiate. Flowers mostly in umbels. Carpels 1-seeded. Embryo small, in large endosperm. Herbaceous or woody.

g. Flowers 5-merous. Styles as many as the carpels.

h. Gynecium 1- to several-celled. Stamens 5 or 10. Fruit a berry or drupe. Woody, with palmately divided leaves, and umbels or racemes. Family 80. *Araliaceæ*, Ivy, p. 619.

*h*2. Gynecium 2-merous, the ripe mericarps coming away from the axis. Sepals reduced to teeth or obsolete. Simple or compound umbels. Leaves usually much divided, estipulate, but with a sheathing base. Family 81. *Umbelliferæ*, Carrot, p. 619.

*g*2. Flowers 5-merous. Gynecium 2–3-celled; style 1. Stamens mostly

5. Fruit a drupe. Mostly woody plants; flowers small, racemed, diœcious in this species. Family 82. *Cornaceæ*, Dogwood, p. 643.

CCC. Subclass SYMPETALÆ, or Metachlamydeæ. Perianth highly specialized, normally double, with the inner perianth sympetalous; a few forms however differing from their allied species by being choripetalous or apetalous.

Families 83–113, pp. 644–906.

d. Pentacyclic-isocarpic sympetals. Besides sympetaly, occasional choripetaly obtains. Staminal cycles 2 or 1. Hypogyny is dominant, epigyny rare. Woody plants and herbs, mostly with simple estipulate leaves, and seeds with endosperm. Flowers usually hermaphrodite.

e. (*Ericales.*) Flowers 5–4-merous, obdiplostemonous, or isostemonous through suppression of the outer series of stamens. Petals free, or mostly united to each other. Stamens mostly hypogynous, occasionally epigynous, often inserted on the base of the corolla-tube. Carpels 2–5, when isomerous usually oppositipetalous. Fruit a capsule or berry, or drupe.

f. Anthers 2-celled, often with paired appendages, and often opening by terminal pores. Pollen in quartets. Stamens mostly 8–10.

Family 83. *Ericaceæ*, Heath, p. 644.

f2. Anthers usually 1-celled, and opening by slits. Pollen simple. Stamens mostly 5–4. Family 84. *Epacridaceæ*, p. 649.

e2. (*Primulales.*) Flowers 5- (4–8) merous, typically eudiplostemonous, but usually isostemonous, and the stamens oppositipetalous, with or without rudiments of an outer series. Rarely unisexual and rarely zygomorphic, also rarely choripetalous. Ovary mostly superior, 1-celled, with a basal or free-central placenta.

f. Seeds usually numerous. Style 1.

Family 85. *Primulaceæ*, Primrose, p. 650.

f2. Seed 1, on a long basal funicle. Styles 5. Flowers usually small, crowded and bracted. Family 86. *Plumbaginaceæ*, Leadwort, p. 654.

e3. (*Ebenales.*) Diplostemonous or triplostemonous, or with few stamens. Sympetalous and hypogynous. Ovary several-celled, cells with 1–few seeds on an axile placenta. Woody plants with alternate, entire leaves, and milky juice. Family 87. *Sapotaceæ*, p. 656.

d2. Tetracyclic, anisocarpic sympetals. Stamens epipetalous.

e. (*Gentianales.*) Flowers regular and hypogynous, usually hermaphrodite; the carpels 2, often only slightly connate. Choripetaly and apetaly occur in exceptional cases. Mostly with opposite, entire, estipulate leaves and endospermous seeds.

f. Stamens only 2, or few. Flowers mostly 4-merous, sometimes apetalous. Trees or shrubs. Family 88. *Oleaceæ*, Olive, p. 657.

f2. Stamens isomerous with the perianth members.

g. No milk-ducts.

h. Ovary 2–4-celled; stigma lobed (antero-posteriorly). Flowers 4–5-merous; seeds 1-several. Trees or shrubs, with stipules or transverse stipular ridges.

Family 89. *Loganiaceæ*, Strychnia, p. 658.

h2. Ovary 1-celled, with 2 parietal placentæ (right and left). Herbs, with leaves opposite or whorled and exstipulate.
Family 90. *Gentianaceæ*, Gentian, p. 660.

g2. With milk-ducts. Herbs or shrubs.

h. Styles united; stigma ring-formed. Stamens distinct; pollen granular. (Endosperm sometimes none).
Family 91. *Apocynaceæ*, Dogbane, p. 663.

h2. Styles united only by the broad apical stigma. Stamens partly united, with pouches and horns, and with carriers of the pollen-masses. Family 92. *Asclepiadaceæ*, Milkweed, p. 663.

e2. Flowers regular or zygomorphic, hermaphrodite. Carpels (mostly 2–3) completely united.

f. Perianth hypogynous.

g. *Tubiflorales*. Flowers typically of 4 isomerous whorls, or with oligomery of the gynecium, and also (in case of zygomorphy) of the stamens. Corolla usually membranous and colored. Chiefly herbs.

h. Flowers mostly radiate. Carpels with few, to 2, seeds. Leaves mostly alternate.

i. Seeds with inferior micropyle and endosperm. Fruit rarely falling apart into 4 valves. Corolla plaited; its divisions contorted.

j. Ovary 2–4 celled; style 1, entire or divided; seeds about 2 in each cell. Corolla usually funnelform, and plant usually climbing. Family 93. *Convolvulaceæ*, p. 665.

j2. Ovary 3-celled; style 3-cleft; each cell with 2 or more seeds. Corolla mostly salver-shaped.
Family 94. *Polemoniaceæ*, Phlox, p. 667.

i2. Seeds with superior micropyle. Inflorescence scorpioid.

j. Fruit a capsule. Ovary 1-celled, with 2 placentæ, or spuriously 2-celled. Style 2-lobed or parted. Seeds 2 or more on each placenta, with endosperm. Herb not twining, with protruding stamens.
Family 95. *Hydrophyllaceæ*, Waterleaf, p. 673.

j2. Ovary deeply 4-lobed around the style, becoming drupelets or nucules. Mostly no endosperm.
Family 96. *Borraginaceæ*, p. 676.

h2. Flowers mostly zygomorphic. Carpels having 2, rarely only 1 seed, with little or no endosperm. Leaves mostly opposite or verticillate.

i. Seeds with inferior micropyle, becoming drupaceous pyrenes or drupes. Ovary 2-celled. Style terminal, mostly simple.
Family 97. *Verbenaceæ*, p. 680.

i2. Ovary 4-lobed around the style; the lobes becoming 1-seeded nutlets; stigma bifid. Stem usually square, and leaves aromatic. Family 98. *Labiatæ*, Mint, p. 694.

h3. Flowers radiate or zygomorphic. Carpels rarely 5, mostly 2 connate, usually with many, rarely with only 1–2, seeds, occasionally

baccate or a stone-fruit, mostly capsules opening not quite to their base.

i. Fruit when capsular dehiscing into 2, rarely 5 or several valves. Isostemonous. Bundles bicollateral. Seeds with endosperm. Inflorescence often cymose.

Family 99. *Solanaceæ*, Potato, p. 698.

*i*2. Capsule 2-celled, with many to few seeds. Bundles collateral. Stamens didynamous, except in some of Family 100.

j. Ovary 2-celled (antero-posteriorly), with axile placenta. Stamens sometimes 5 or 2. Endosperm. Leaves mostly alternate.

Family 100. *Scrophulariaceæ*, Snapdragon, p. 713.

*j*2. Ovary 2–1-celled. Seeds many, flat, winged, with little or no endosperm. Trees or shrubs, mostly with opposite leaves. Family 101. *Bignoniaceæ*, p. 727.

*j*3. Ovary 1-celled, with 2 parietal placentæ (or 2- or 4-celled by ingrowth). Leaves opposite or whorled. Endosperm present or none. Herbs.

Family 102. *Gesneriaceæ*, p. 728.

*i*3. Ovary 1-celled, or falsely 2–4-celled. Seeds few, not winged, with little endosperm. Capsule horned. Stamens as in *Scrophulariaceæ*. Gland-bearing herbs; leaves mostly opposite. Family 103. *Martyniaceæ*, Unicorn-plant, p. 730.

*i*4. Ovary 1-celled, with many seeds; no endosperm. Corolla with a palate. Stamens 2, the anther-cells confluent. Floating, aquatic or bog herbs; the leaves tufted, or floating and utriculiferous, or mere scales.

Family 104. *Lentibulariaceæ*, Bladder-wort, p. 730.

*g*2. (*Plantaginales.*) Flowers 4-merous, radiate, hermaphrodite or unisexual. Leaves mostly alternate or basal. Usually herbs, rarely with woody stock. Corolla scarious. Ovary 1–4-celled; capsule often circumscissile. Flowers mostly in heads or spikes; but in southern forms, few or solitary on the scape.

Family 105. *Plantaginaceæ*, p. 731.

*f*2. Perianth epigynous.

g. Stamens not united. (*Rubiales.*) Flowers 5–4-merous, the stamens or carpels often fewer; radiate or zygomorphic. Ovary divided or 1-celled; the cells with several to 1 pendent seeds. Woody plants or herbs, with opposite, mostly entire leaves.

h. Stamens isomerous. Leaves stipulate or verticillate. Ovary 2–8-cells, the cells mostly 1-seeded.

Family 106. *Rubiaceæ*, Madder, p. 738.

*h*2. Stamens fewer than the perianth-segments. Ovary with only 1 fertile cell, 1-seeded. Leaves exstipulate.

i. Calyx at first obscure, afterwards often forming a pappus. Seeds without endosperm. Flowers slightly irregular.

Family 107. *Valerianaceæ*, p. 744.

i2. Calyx developed. Ovary 1-celled; style simple; stigma terminal. Seeds with endosperm. Flowers in an involucrate head. Family 108. *Dipsacaceæ*, Teasel, p. 750.

g2. Stamens connivent or united. (*Campanulales.*) Flowers typically 5-merous, isostemonous, usually with gynecial oligomery. Ovary several-celled, with several to 1 seed in each cell, or only 1-seeded. Mostly herbs; sometimes shrubs. Leaves exstipulate.

h. Stamens not united (except in subfam. *Lobelieæ* and some *Goodeniaceæ*).

i. With segmented milk-ducts. Ovary 2–several-celled. Style non-indusiate. Family 109. *Campanulaceæ*, Bellflower, p. 751.

i2. No milk ducts. Ovary 1–2-celled, 1- to many-ovuled. Style indusiate. Leaves simple. Family 110. *Goodeniaceæ*, p. 755.

h2. Stamens 2, united by their filaments to the style. Ovary 2-celled, seeds numerous, with endosperm. No milk-ducts. Family 111. *Candolleaceæ*, p. 756.

h3. Stamens isomerous with the corolla-lobes, more or less united. Flowers in involucrate heads.

i. Filaments united, and base of anthers. Style undivided; stigma capitate. Seed pendulous, with little endosperm. Calyx represented by teeth or lobes. Family 112. *Calyceraceæ*, p. 756.

i2. Anthers normally united. Style 2-branched (except in the barren flowers). Seed erect, without endosperm. Calyx represented by a pappus or wanting. Family 113. *Compositæ*, Daisy, p. 764–906.

PART VII.

COLLECTORS AND BIBLIOGRAPHY.

1. COLLECTORS.

Philip Commerson, the botanist of Bougainville's French Exploring Expedition, visited Magellan Strait in 1767–68, and gave to the scientific world its first collection of the plants characteristic of the region. J. Banks and D. Solander were the naturalists on Captain Cook's First Voyage, 1768–71, and J. R. Foster and his son, G. Foster, and A. Sparrman, were on Cook's Second Voyage, 1772–75, which visited the Antarctic regions and the Fuegian islands. Anderson on Cook's Third Voyage, and Menzies, who was Surgeon and Naturalist on Vancouver's Voyage, 1791, collected on the Pacific shores of Patagonia.

After the episode of the Napoleonic wars the spirit of geographical and scientific exploration revived primarily with the French, and afterwards with the British. In 1817 Gaudichaud sailed under Admiral Freycinet in two French corvettes on a scientific expedition to New Holland and the East Indies. In course of their return by Cape Horn with valuable botanical collections one of the ships was wrecked on a hidden rock. Gaudichaud's plants, however, were ultimately saved from the wreck, and were further enlarged by collections made on the Falkland Isles. Admiral d'Urville afterwards visited these islands in another French ship and increased Gaudichaud's discoveries. Dr. Eights, an American, also landed on the South Shetland Isles, where he found *Aira antarctica*, the most southern of flowering plants. In 1826–30 the Exploring Expedition under Captain King made further collections in Magellan Strait. The interest in the natural history of the far south of the American Continent received a new impulse from the explorations and singularly bold speculations of Charles Darwin, who went in his early manhood under Captain Fitzroy as naturalist on board the *Beagle*, 1831–36. His indefatigable industry and his observations during the voyage, and the charm-

ing descriptions which he gave of what he had seen, as well as the numerous specimens collected and his interesting speculations, rendered the field of his explorations forever classical, and formed a proper opening for the career which has made his name a household word. When in Southern Patagonia, he led a botanical expedition up the Rio Santa Cruz more than 300 kilometers inwards. His work was primarily on the Zoölogy and the Geology of the countries visited; but he never missed an opportunity of gathering examples of the vegetation. His visits were quickly followed by Jacquinot, Hombron and Gaillant, 1837–38, to Magellan Strait. Then the United States Exploring Expedition, under Captain Wilkes marked the entrance of our Western Republic into the civilizing service of science. The results of this voyage were partly worked out and a couple of botanical volumes published under the care of Asa Gray. The great British expedition to the south speedily followed, in the ships *Erebus* and *Terror*, 1839–43, under Captain Sir James C. Ross, with Joseph Dalton Hooker as botanist. Hooker's splendid volumes on the *Flora Antarctica*, illustrated by colored plates, are the outcome of this expedition, with companion volumes on the Flora of New Zealand and of Tasmania. The first volume of the *Flora Antarctica* is confined to the plants of a few islands in the neighborhood of New Zealand; and the second, much the larger volume, deals with the vegetation of Patagonia and neighboring islands (including the Falklands, South Shetlands, South Georgia) and also of the more distant Tristan d'Acunha and Kerguelen. Of this last Hooker writes: "It may appear paradoxical, at first sight, to associate the plants of Kerguelen's Land with those of Fuegia, separated by 140 degrees of longitude, rather than with those of Lord Auckland's group, which is nearer by about 50 degrees. But the features of the Flora of Kerguelen's Land are similar to, and many of the species identical with, those of the American continent, constraining me to follow the law of botanical affinity in preference to that of geographical position." This statement, published in 1847, was the precursor of several striking discussions as to the origin and probable distribution of species, contrary to the views which at that date were prevalent in the New World; these discussions prepared their author for a ready acceptance of the generalizations of A. R. Wallace and Charles Darwin, which, whether accepted in their totality or not, had the effect of disposing of the preceding speculations in the same field.

In his introduction to Vol. II of *Flora Antarctica* Dr. Hooker says, "The successive labors of Commerson, Banks and Solander, and of Menzies, early called the attention of Botanists to the singular aspect of the Fuegian Flora, apparently incompatible in its luxuriance with the rigor of the climate. The subsequent exertions of Captain King and Mr. Anderson, and of Darwin, during the voyages of Captain Fitzroy, of d'Urville, and the officers of our own late Antarctic Expedition, have nearly exhausted the phanerogamic productions." Dusén's remark on this statement is that "it may have been justified regarding the Western and Southern Vegetation of Fuegia, but not at all in regard to the steppes." As to other parts of the Patagonian Region, a great many new species have been described since Hooker's work appeared; and we confess to our surprise in reaching a total of more than 2,100 species of Phanerogams as already described from the mainland and adjoining islands, south of the 39th parallel.

Since and partly concurrently with the work of Hooker, the Chilian botanists have extended their view to Patagonia, most of which is under Chilian government. Carl Gay's large work on Chili devotes eight volumes to its Botany (1845–53), with many descriptions of the Magellan plants. The Philippi's, father and son, are the great authorities on the Chilian plants since Gay's time; and Carl Reiche is ably carrying on the succession in that part. In 1866–69, Robert O. Cunningham afterwards of Belfast College, Ireland, went as naturalist on board a small English Steamer, the *Nassau*, which was sent to survey the Strait of Magellan; the fruit of his work was a large collection of plants as well as animals, and a book on the Natural History of the Strait of Magellan, which is full of life-sketches of the inhabitants, animal and vegetable, of those parts and of their habits. The Argentine Government having control of North Patagonia, on its eastern slope, sent an Exploring Expedition to Rio Negro, under Captain Roca, the Botany of which was prepared for the Report by Lorentz and Niederlein (1881). W. Lechler and the Frenchmen, Savatier, Hariot, and Hyades, the last in the Scientific Mission to Cape Horn (1882–1883), made large contributions. Collections have been made and a great many new forms described and published by C. Spegazzini from different parts of the Region, including Fuegia. In 1896 N. Alboff visited the parts about Ushuaia, on the Beagle Channel, and Staaten Island, and published his observations on the vegetation. The

Swedish expedition (1895–97) under O. Nordensköjld, though chiefly geological, had Mr. Per Dusén as its botanist, who made independent excursions to Patagonia, Chili and Fuegia, and whose publications on the Bryophytes and Flowering Plants have done much to extend our knowledge of the general character of the flora.

Dusén had been previously employed by the Chilian Government as a member of an exploring party along the River Aysen, and on the Guaitecas Islands, and thereby had an opportunity to study the forest-vegetation, and particularly the rich undergrowth of mosses and ferns which are characteristic of the rainy western coast. His later collections were made first about Puerto Madryn (43° 20′ S. Lat. on the east shore), from the xerophil coast and the drifting sand; next along the Rio Chubut, near its mouth; and by the mouths of Rio Sta. Cruz and Rio Gallegos; and about Punta Arenas and Porvenir across the Strait from Punta Arenas, and at Paramo, Rio Grande and neighbouring parts of Fuegia; next at Admiralty Sound, and at Rio Azopardo, and in West Magellan, in Desolation Island, particularly near Puerto Angosto just east of that island, on the narrowest part of the strait. Late in the season, and at a very unfavorable time in that climate for collecting (May 1), he reached Ushuaia on the Beagle Channel, whence he returned to Punta Arenas. His collections, and those made by Nordenskjöld along the Gallegos, and at Ultima Esperanza and Lago Sarmiento, have been already worked and partially reported on, as to the Phanerogams and Bryophytes. The same report also includes a collection by Bruno Ansorge who had been engaged at Goldmines of Paramo on the Atlantic coast of Fuegia.

The Princeton University Expeditions (Dr. J. B. Hatcher and O. A. Peterson, 1895–96) were almost simultaneous with the Swedish, and in large measure over part of the same ground, penetrating farther up the Eastern Cordilleras, with the natural result that the collections are not very dissimilar, and that most of the new species have been described in the Swedish reports. As Professor Evans and Mr. Dusén have shown above, the Hepaticæ and Musci contain interesting novelties. As to the phanerogams the most interesting novelties have been described in their place in Part V of this volume.

In the season 1899–1900 Mr. Barnum Brown collected chiefly Flowering Plants along Rio Gallegos, and Cryptogams in Fuegia, near the Beagle Channel and on western coast and islands of Fuegia. This col-

lection is in the Herbarium of the New York Botanical Gardens, and its phanerograms are included in this volume.

2. BIBLIOGRAPHY.

For the names of species and their general distribution, our chief reliance has been the *Index Kewensis* as amended and supplemented by O. Kuntze's *Revisio Plantarum* and by Engler and Prantl; also the American text-books, such as Gray's Synoptical Flora, and Britton and Brown's Illustrated Flora; Coulter's Rocky Mountain Flora, and Sereno Watson's Botany of California. For the characteristic Patagonian plants we use, beside the older works, as Persoon's Synopsis and DeCandolle's Prodromus, the Flora Antarctica, and the great works of Gay, of the Philippis, Reiche and the Argentine botanists, and most of all Carlos Spegazzini's and Per Dusén's recent contributions.

For characteristic field-notes we are indebted chiefly to this last mentioned contribution, and to Hooker, to Cunningham, and to Hatcher, and as to North Patagonian plants to Ball's paper in the Linnæan Society's Journal.

The subjoined list indicates the books and authorities which we have found most serviceable for descriptions of the Patagonian species.

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PART VIII.

TOPOGRAPHY.

For botanical purposes we divide the Patagonian region into several districts. The great eastern plain has the Province of Rio Negro in the north, so named from its chief river. Its northern boundry is Rio Colorado. At the mouth of Rio Negro is the town Carmen de Patagones; half way up its main course is Choele-choel; and as far again is Roca fortress, where the main river is formed by a northern and a southern branch, the Neuquen and the Limay. Mid-Patagonia is called Chubut, from its long and very circuitous river. Rawson is a settlement near the mouth of this river, and Trelew is farther up. Puerto Madryn is a small seaport further north of Rawson, and Puerto Deseado (Port Desire), at mouth of Rio Deseado, is southward of the great Gulf of San Jorge, near the 48th parallel. South Patagonia is called the Province of Santa Cruz, from its chief river. Farther south it contains the Rio Gallegos, with Puerto Gallegos. Along the Magellan Strait, and extending up to near the Rio Gallegos is the region of Magellan's-land, or Magellanica. And south of the Magellan Strait is what we have termed Fuegia, the great Archipelago of the South. On the Strait of Magellan are the two towns, Punta Arenas, in its eastern part, and Puerto Angosto, where it is narrowest, towards its western exit. West of the Great Cordilleras, and along the entire Strait of Magellan the political status is Chilian; and on the long Concepcion Channel which separates Wellington Island from the mainland, Port Eden is situated about 49° S. Lat. Most of the Cordillera, with its great lakes, and the eastern plains and plateau at the foot of the mountains, also part of Fuegia, including Ushuaia and Lapataia on the Beagle Channel, belong to Argentina.

The following list gives the situation of most of the locations mentioned in the preceding pages.

GLOSSARY OF LOCALITIES. (Map, Pl. II, III.)

Adelaide Archipelago, on Pacific Coast, Lat. 52° S.
Admiralty Sound, penetrating Fuegia from Useless Bay, Lat. 54° S.
Agaia, in Hoste Id.
Aicina, in Hoste Id., opposite Ushuaia, Lat. 55° S.
Aisen, Rio, W. Patagon., entering the sea at S. Lat. 45° 20′.
Alumine, Rio, in Neuquen R.
Amarillo, Lago, S. of Grand Gente Bay.
Ancud, Gulf, on W. Coast, about Lat. 41° 40′ S.
Anegada Point, in Magellan Str., Fuegian side, at first Narrows.
Angosto, Puerto, in W. Magellan Str., Desolation Id.
Arenas, Punta, settlement on W. side of Magellan Str., Lat. 53° 15′ S.
Arenas, Punta, on E. side of N. Fuegia, Atlantic Coast, Lat. 53° 20′ S.
Argentino, Lago, in S. Patagon., near Cordilleras, Lat. 50° 30′ S.
Aysen, Rio, to Pacific, Lat. 45° 20′ S.
Azopardo, Rio, in S. Fuegia from Lago Fagnano to Admiralty Sound.
Baguales, district in S. W. Patagonia, by Ultima Esperanza.
Bahia Blanca, in S. Argentina, on Atlantic Coast, Lat. 38° 45′ S.
Banner Cave, Picton Id., E. of Fuegia.
Barancas de Carmen Silva, E. Fuegian Coast.
Barancas de San Gregorio, Hills to N. of Magellan Str. entrance.
Barbara Sound, from W. end of Froward Reach, southwards.
Basket Id., Pacific Coast, S. W. of Fuegia.
Beagle Channel, from Atlantic to Pacific, Lat. 55° S.
Beauclerk Id., S. of Magellan Str., and E. of Desolation Id.
Blanco, Lago, S. Patagon., Long. 71° 15′ W.
Blest, Puerto, W. shore of Lago Nahuel-huapi.
Blossom Bay, N. point of Staaten Id.
Bolsom Rocks, Chubut, Boron-aik, by Rio Scheuen.
Boucault Bay, in Magellan Str.
Brecknock Mts. and Pass, W. of Punta Arenas, neck of Brunswick Penins.
Brecknock Point and Penins., on Pacific, W. extremity of Fuegia, Lat. 54° 40′ S.
Broad Reach, southward stretch of Magellan Str., at Long. 71° W.
Brunswick Penins., W. of Broad Reach, Lat. 53° 30′ S.
Bueno, Puerto, on Sarmiento Channel, Lat. 51° S.
Buenos Aires, Lago, E. of Cordilleras, Lat. 47° S.
Burnt Id., on Orange Bay, S. of Isle Hoste; another E. of Basket Id.
Camden Id., on Pacific Coast, Lat. 54° 45′ S.
Candaluria, Rio, in E. Fuegia, probably entering Rio Grande.
Carmen de Patagones, near mouth of Rio Negro, Lat. 41° S.
Carmen Sylva, Rio, entering Atlantic at Cape Sunday, 53° 40′ S.
Carmen Sylva, Sierra, crossing Fuegia from Useless Bay to Cape San Sebastian.
Carren-Leofú, Rio, in Chubut.
Carr-aiken = Karr-aiken, on Lake Argentino.
Chacabuco, on Nahuel-huapi, Lat. 41° 30′ S.

Chalia, Rio (Rio Scheuen) to Rio Chico, Lat. 49° 20′ S.
Chico, Rio, in S. Patagon., branch of Sta. Cruz. Another from E. Magellan to Puerto Gallegos.
Chiloe Id., Pacific Coast, Lat. 43° S.
Choele-choel, on Rio Negro, Lat. 39° 20′ S.
Choique-Lauen, near Lago Musters, Chubut.
Chonkenk-Aike, by Rio Chico de Sta. Cruz.
Chonos Archip., Pacific Coast, Lat. 45° S.
Chubut, Rio and Prov., Mid.-Patagon., Lat. 44° S.
Churucca, on Sea Reach, in Desolation Id.
Clarence Id., Magellan Str., S. of Froward Reach.
Cockburn Channel, from Magellan Str., by Magdalena Channel, southwards at Long. 71° W.
Colhue, Lago, in Chubut, Lat. 45° 30′ S.
Colu-huapi, Lago, at Trelew, Chubut.
Concepcion Canal, on Pacific, Lat. 51° S.
Condor, Rio, on W. coast of Tierra del Fuego.
Confluencia, junction of Limay and Neuquen in N. Patagon.
Cook, Port, Staaten Id., N. side.
Corcovado Golfo, Pacific Coast, within Chiloe, Lat. 43° S.
Cordova Penins., N. of Long Reach on Magellan Str.
Crossley Bay, N. W. of Staaten Id., Lat. 54° 40′ S.
Darwin Canal and Sound, W. continuation of Beagle Channel, Lat. 55° S.
Darwin Mts., in W. Fuegia, N. of Darwin Canal.
Dawson Id., eastward of Froward Reach, Lat. 54° S.
Delgada, Punta, on Valdez Penins., Lat. 42° 40′ S.
Deseado, Rio and Puerto (Port Desire), on Atlantic, Lat. 47° 45′ S.
Desolation Id., the most western isle south on Magellan Strait.
Divide Point, eastern extremity of Gordon Id.
Dungeness Point, N. at eastern entrance to Magellan Strait.
Eden, Port, in Concepcion Channel, W. Patagon., about 49° S. Lat.
Elizabeth Port, in Magellan Str., N. of Punta Arenas.
Esperanza Ultima Inlet, S. Patagon, Cordilleras, Lat. 51° 20′ S.
Fagnano, Lago, extending E. by S. from line of Admiralty Sound.
Falkland Isles, in Atlantic, 540 kms. E. of entrance to Magellan Str.
Famine Bay, Fuegia, on Broad Stretch, Lat. 53° 30′ S.
Famine, Port, Brunswick Penins., Lat. 53° 30′ S.
Fontana, Lago, near Cordilleras, Lat. 45° S.
Franklin Bay, W. side of Staaten Id.
Froward, Cabo, S. E. point of Brunswick Penins.
Froward Reach, in Mid-Magellan Str., S. of Brunswick Penins., Lat. 54° S.
Fuegia (Tierra del Fuego), island to east and south of Magellan Str., Lat. 54° S., also collectively for all the islands to Cape Horn.
Gable Id., off Ushuaia, in Beagle Channel.
Gallant, Port, Brunswick Penins., at W. extremity of Froward Reach.
Gallegos, Rio, in S. Patagon., Lat. 51° 45′ S.
Good Success Bay, E. coast of Fuegia, S. of Str. of Lemaire.
Gordon Id., in W. part of Beagle Channel, Lat. 55° S.

Grafton Isles, S. of Sta. Ines Id.
Grand Gente Bay, Fuegia, on Broad Reach, at Lat. 52° 45′ S.
Grand Glacier, N. of Beagle Channel, above Lapataia.
Grande, Rio, E. Fuegia, entering the Atlantic at 53° 50′ S. Lat.
Gregory Bay, in Magellan Str., N. side of entrance.
Guaitecas Isles, on W. coast, Lat. 43° 50′ S.
Haichol, Sierra de, Neuquen.
Hall, Cape, in eastern Fuegia.
Hanover Isle, on Pacific Coast, Lat. 51° S.
Hermite Isle. N. W. of Horn Isle, Lat. 55° 50′ S.
Hombre, Puerto del.
Hope Harbor, E. coast of Clarence Isle.
Hoppner, Port, on N. coast of Staaten Id.
Horn, Cape and Isle, Lat. 56° S.
Hoste, Isle, N. W. of Horn Id., Lat. 55° 20′ S.
Iandigaia, channel limiting Argentine and Chilian parts of Fuegia.
Jacques Id., S. of Magellan Str., at 73° 30′ W. Long.
Jorge, Golfo de San (St. George's Bay), Atlantic Coast, Chubut, Lat. 46°.
Jose, Peninsula de San (Valdez Penins.), Atlantic Coast, Lat. 42° 40′ S.
Julian, Puerto de San, Atlantic Coast, Lat. 49° 30′ S.
Karr-aiken, on Lago Argentina, Lat. 50° 30′ S.
Killik-aike, on Rio Gallegos, near its mouth.
King-William Land, between Skyring Water and Smith Sound, Lat. 53°.
Kuan-aik, near Lago Argentino.
Lajara, Lago, near Cordilleras, N. Patagon., Lat. 40° 25′ S.
Lapataia, N. shore of Beagle Channel, W. of Ushuaia.
Lemaire Strait, at Staaten Id., Lat. 54° 45′ S.
Leone, Rio, L. Viedma to Argentino, Lat. 50° S.
Limay, Rio, N. Patagon., tributary of Rio Negro, Lat. 40° S.
Leones I., on Atlantic coast, near 45° S., also at mouth of Rio Sta. Cruz.
Lomas Bay, Fuegia, at eastern entrance of Magellan Str., 52° 40′ S.
Lomas Bay, second, on W. side of Dawson Id., 53° 45′ S.
Londonderry Isle, Pacific coast, W. of Gordon Id., Lat. 55° S.
Long Reach, mid-part of Magellan Str., W. Long. 72° 30′ to 73° 30′ S.
Low, Puerto, in Guaiteca Isla.
Madre de Dios Archip., on Pacific, Lat. 50° 30′ S.
Madryn, Puerto, on Atlantic, Chubut, Lat. 43° S.
Magdalena Id., just southeast of Elizabeth Id., in mid-channel of Magellan Str.
Magdalene Sound, from Froward Reach southward, 71° W. Long.
Magellan Str., from Atlantic to Pacific, Lat. 52° 20′ S.
Maipu, near Cordilleras, Lat. 40° 25′ S.
Malouine Ids., Falkland Ids. In Atlantic, 540 kms. from Magellan Str.
Manso, Rio, flowering into Reloncavi Inlet.
Martial Mts., N. of Ushuaia.
Martin, Rio San, in N. Fuegia, entering Bahia San Sebastian, 53° 20′ S.
Melville Id. small, W. of Clarence Id., Lat. 54° 30′ S.

Messier Canal, on Pacific, 48° S. Lat.
Molyneux Sound, in W. Patagon., about 50° 16′ S.
Musters, Lago, Chubut, Lat. 45° 30′ S.
Nahuel-huapi, Lago, in Cordilleras, Lat. 41° S.
Navarin Id., S. of E. end of Beagle Channel, Lat. 55° S.
Negri Fiord (Sarmiento Fiord), in angle of Magdalene Sound.
Negro, Rio, N. Patagon., Lat. 40° S.
Neuquen, Rio, tributary of Rio Negro, Lat. 39° S.
Newton Id., in Queen Adelaide Archip.
Nuevo, Puerto, on Lago Nahuel-huapi.
Oazy Harbor, Magellan Str., beyond second Narrows, N. side.
Ofqui-ness, W. coast, about Lat. 46° 45′ S.
Olivaia, Mt., N. of Beagle Channel, E. of Ushuaia.
Onniuaia, on Fuegian coast, at foot of Mt. Darwin.
Orange Bay, east of Hoste Id., Lat. 55° 40′ S.
Orr-aike, on L. Viedma.
Otway Bay, on Pacific, S. of Desolation Id., Lat. 53° 20′ S.
Otway Water, from N. side of mid-Magellan Str., Lat. 53° S.
Oveja, Sierra, on Rio Chico de Sta. Cruz.
Packewaïa, in Gable Id., Beagle Channel, 67° 25′ W.
Packsaddle Id., N. E. of Hoste Id., Lat. 55° S.
Pactolus Bay, N. coast of Staaten Id.
Palena, Rio, to Pacific, Lat. 43° 50′ S.
Pan de Azucar, on Rio Chico.
Paramo, El, N. of San Sebastian Bay, at Lat. 53° S., on Atlantic coast.
Parr-aik, by Rio Chico.
Pavon Id., S. Patagon., at mouth of Sta. Cruz River.
Pavonia, across the Str. from Punta Arenas.
Penos Gulf, Pacific coast, Lat. 47° S.
Philip Bay, Fuegia, second within Magellan Str.
Picton Id., coast of Fuegia, at entrance to Beagle Channel.
Pillar, Cape, N. W. extremity of Desolation Id., on Pacific.
Poli Carpo Cove, eastern Fuegia.
Ponsonby Land, between Otway Water and Skyring, Lat. 52° 40′ S.
Ponsonby Sound, from Beagle Channel, W. of Navarin Id., Lat. 55° S.
Porvenir Bay, E. side of Broad Reach, about Lat. 53° 25′ S.
Possession Bay, near entrance to Magellan Str., N. side.
Punta Arenas, promontory on Atlantic coast of Fuegia, Lat. 53° 10′ S.
Punta Arenas, settlement in Broad Reach, Magellan Str., Lat. 53° 15′ S.
Pyramids Mts., N. of Beagle Channel, W. of Lapataia.
Rawson, Port, Atlantic coast, at mouth of Rio Chubut, Lat. 43° 20′ S.
Reloncavi Inlet, on W. coast, about Lat. 41° 30′ S.
Rinihue, Rio and Mt., in Valdivia.
Roca, Puerto, Staaten Id.
Roca, Station and Fort, at confluence of Limay and Neuquen in N. Patagon.
St. Catherine Point (Punta Catalina), Fuegia, at E. entrance to Magellan Str.

Sta. Ines Id., S. of mid-Magellan Str.
St. John Port (Puerto San Juan), Staaten Id., Lat. 54° 45′ S.
St. Vincent, Cape, E. point, second narrows of Magellan Str.
San Antonio Cape, on W. of Dawson Id., also on N. of Staaten Id.
San Carlos, S. E. point of Lago Nahuel-huapi.
San Diego Cape, E. point of Fuegia, Lat. 54° 40′ S.
Sanguil, Sierra de, Neuquen Territory.
San Jorge, Golfo (St. George's Bay), Atlantic coast, Lat. 46° S.
San José Penins. (Valdez), Lat. 43° S.
San Julien, Puerto, Atlantic coast, Lat. 49° 30′ S.
San Martin, Rio, to Bahia San Sebastian, Lat. 53° 20′ S.
San Matias, Golfo, Atlantic coast, Lat. 41° 30′ S.
San Sebastian, Fuegia, E. coast, Bay and Cape, Lat. 53° 20′ S.
Santa Cruz, Rio, Lago Argentino to Atlantic, Lat. 50° 20′ S.
Sarmiento, Channel, Pacific coast, Lat. 51° 30′ S.
Sarmiento Fjord (Negri Fjord), at Magdalena Channel.
Sarmiento Mts., Fuegia, S. of Dawson Id., Lat. 54° 30′ S.
Scheuen, Rio (Rio Chalia), S. Patagon., to Rio Chico, Lat. 49° 20′ S.
Sea Reach, western section of Magellan Str., N. of Desolation Id.
Senger, Rio, to Rio Chubut, Lat. 44° S.
Sheep Id., S. of Orange Harbor, Lat. 55° 30′ S.
Sierra de Carmen Sylva, across E. part of Fuegia from Useless Bay to Cape San Sebastian.
Skyring Water, connecting with Otway, Lat. 52° 40′ S.
Slogget Harbor, Fuegia.
Smith Channel, leading N. from W. Magellan Str., Lat. 52° 30′ S.
Spaniard Harbor, Fuegia.
Springhill, in N. Fuegia, midway between Lomas Bay and Philip Bay, at 52° 40′ S. Lat.
Staaten Id., E. of Fuegia, Lat. 54° 45′ S.
Stanley, = Carmen de Patagones, at mouth of Rio Negro.
Stewart Id., on Pacific, at W. entrance of Darwin Canal, Lat. 54° 30′ S.
Three Brothers (Tres Hermanos), Mts., N. E. coast of Fuegia, near Cape San Diego.
Traful, Lago; Todos los Santos, Lago, in N. Patagon. Cordilleras.
Trelew, in Chubut.
Tres Montes, Cape and Penins., on Pacific, Lat. 47° S.
Tres Puntas, Cabo, on Atlantic coast, Lat. 47° 15′ S.
Trollope, Valle, Neuquen.
Uallamatu, Fuegia, E. of Ushuaia.
Useless Bay, from Magellan Str. to E., at Lat. 53° 30′ S.
Ushuaia, settlement of English Mission, on N. shore of Beagle Channel, 68° 20′ W. Long.
Valdez Penins. (San José), on Atlantic coast, Lat. 42° 40′ S.
Valdivia, City and Province on the Pacific, about Lat. 40° S.
Valentine Cape, N. point of Dawson Id., Lat. 53° 30′ S.
Vancouver Port, on S. coast of Staaten Id.
Ventana, Sierra, in S. Argentina, N. of Bahia Blanca, Lat. 38° S.
Verde, Lago, South of Lago Amarillo, N. of Porvenir in N. Fuegia.
Viedma, near mouth of Rio Negro, Lat. 41° S.

Villarino, in Golfo di San Matias, Lat. 40° 45′ S.
Villarino, Bay in W. Fuegia, between Brecknock Penins. and Darwin Canal.
Virgenes, Cabo, S. E. point of continent, Lat. 52° 15′ S.
Voces Bay (Port Famine), on Magellan Str., S. of Punta Arenas.
Wellington Id., on Pacific, Lat. 49° 30′ S.
Wollaston Id., N. of Horn Id., Lat. 55° 45′ S.
Worsley Sound, connecting with Smith Channel and Pacific, Lat. 52° S.

PART IX.

CHARACTER AND ORIGIN OF THE PATAGONIAN FLORA.

We include the mainland, and also the adjoining islands of Peraustral America, as all constituting one botanical region. This is the meaning of the term "Patagonian" which DeCandolle adopts in his *Prodromus*, where he explains Patagonian Plants, "nempe in Patagonia, insulis maclovianis, et terris magellanicis crescentes." It is incorrect to speak of this as an antarctic region; it is cold-temperate; Cape Horn being in the same southern latitude as Edinburgh is northern; and the mouth of the Strait of Magellan corresponding to central England; the Rio Sta. Cruz to Land's End; and the Rio Negro of Northern Patagonia agrees in latitude with Madrid in Spain. Whilst southern latitudes have a more rigorous climate than corresponding northern, we think that the case has been greatly exaggerated by representing the Patagonian region as in any way a counterpart of an Arctic climate. Botanically considered, the Arctic regions can scarcely be said to possess an indigenous flora; they have struggling stragglers from lower latitudes. But in some parts of the Patagonian area the indigenous flora is surprisingly rich.

We must be satisfied by referring to Dusén's observations on the west-Patagonian flora as given in this volume; and to his papers on the vegetation of western Fuegia and of the Magellan's-lands named in the Bibliography at p. 928. Alboff is enthusiastic in describing the splendid forests of Fuegia, especially of the southern and western parts of the archipelago. The scenery is shown by him to be all the more impressive because it is unexpected. After coasting along the eastern seaboard of the Patagonian mainland, with its gloomy, treeless barren surface of sand and shingle, which extends for about a thousand kilometers along the coast, and penetrating the equally uninviting parts of eastern Magellania the scene changes all at once. The northern and eastern parts of Tierra

del Fuego present the same dreary aspect as before, with occasional hills. But on passing Punta Arenas, and entering the Magdalena Channel, which is the usual route for reaching the southern part of the Archipelago, one finds the picture change as if by magic. On all sides of the narrow winding channels, are lofty mountains, clothed from base to summit with fresh and gay forest verdure; and behind are peaks covered with perpetual snow, whilst glaciers and cascades abound. The forests are impenetrable, beech-trees overgrown by lichens, mosses, small filmy ferns, all delighting in the moisture; and many herbs with showy flowers, orchids, compositæ, violets, blackberries, growing amid the forests. The forests themselves continue far up the hills, the trees becoming smaller as one ascends, and also becoming more intricately woven together; not ceasing usually until they reach an altitude of some 500 meters. The dwarf forms of the southern beech, *Nothofagus antarctica* (which is *not antarctic*), here forms a barrier which cannot be passed save by hewing the way with an axe. No such forest-life is known elsewhere, even in cold-temperate regions. Alboff, calling southwestern Fuegia hyetophilous, because of its great moisture, and in contrast with the xerophilous climate of the steppe lands of east Patagonia, would call the southeastern part of Fuegia, and of the adjacent Staaten Islands, mesohyetic, or with mean-moisture. At Orange Bay, near Cape Horn, the rainfall is about twice as great as the mean, being 150 cm. (60 in.) per annum. The southern part of the Archipelago, especially along the Beagle Channel, with the islands of Navarin, Sta. Ines, Hoste, and Cape Horn present very peculiar structural and botanical features. Most significant are the numerous cases of identity, or close affinity with plants in Kerguelen Id., Southern Australia, Tasmania, New Zealand, and the southern sporadic islands. For example the most beautiful shrub in existence is the *Veronica elliptica*, of Fuegia and New Zealand, an extraordinary case of discontinuity. (See p. 722.)

The name Tierra del Fuego, the land of fire, was given by Magellan because of the numerous fires kept burning by the natives, as incidental to open-air life in such latitudes. The name Cape Horn commemorates the Dutch Seaman who wore his ship round the south and proved that the land did not extend to the south pole. Its other name Cape Stiff, is more descriptive, for its fierce eastward winds and its high "gray beards" or waves, compel seamen to avoid it in their westward passage; thus

they mostly prefer the Magellan channel, with all its windings, its fogs and its rocks. To go eastwards by Cape Horn, even onwards to Australia, is only to "run the easting down" where the chief risk is that the waves may rush the ship too fast for safety.

Proceeding northward from Cape Horn, along the eastern coast of Fuegia, one comes to two groups of islands, Staaten Island, separated from the main land by the Strait of Lemaire, 25 kilometers wide, and richly wooded; the other islands are the Falklands (known to the French as the Malouines), directly east of the entrance to Magellan Strait, at a distance of 500 kilometers. These islands have rocky heights, extensive moorlands, and peat bogs, large freshwater pools and rivulets, and the extraordinary phenomenon of "streams of stones" slowly descending from the hills, like petrified glaciers from their elevated breeding-place. The absence of trees from the Falklands and the presence of some peculiar plants, most famous being the "tussock-grass" (*Poa flabellata*), and the "wiry-grass" (*Deschampsia antarctica* and *flexuosa*) are characteristic; also the *Nassauvia serpens*, which sends leagues of its root down among the rocks. The islands are also the home of forms which prove that they have been the landing place, or the point of departure, for plants which are common to peraustral America and the Australasian lands.

Niederlein refers to the arid and stern, often very bleak aspect of the vegetation of the eastern Patagonian plains; for thousands of square leagues there being nothing but dry grass, and loose sand mingled with salt; and the fierce storms come from the southern icy sea across the steppes. Rain seldom falls, and the water is received into salty morasses. No brook enters the few rivers which cross from the mountains in deep channels. The vegetation consists of few stiff grasses, woody, and mostly glutinous or thorny hairy bushes, and shrubs of 1–3 meters height, bare, stump-like, apparently dead after losing their few leaves. Even during the growing period the older branches are often leafless, and apparently lifeless. The leaves may be small and caducous, or fleshy, or leathery, hard, or prickly, or transformed into spines, and sometimes stripped off. Only a few of the flowers are remarkable for beauty, or fragrance or size.

On account of these vegetal affinities of distant lands, all the southern hemisphere has been included by some authors in a single "Antarctic" botanical region. Karl Reiche makes this one of the fifteen great floral regions of the world, being characterized by forests of evergreen beeches,

Myrtaceæ, and certain Coniferæ; and he would include in it with peraustral America, southern parts of Australia, also Tasmania, New Zealand and the sporadic islands of the southern ocean (none of those with living vegetation being within the antarctic circle).

The Patagonian part of this larger complex, has been compared to an ovate leaf, its base about Sierra Ventana, in Southern Argentina, 38° S. Lat., and extending across to Valdivia on the Chilian coast about 39°. The distance from this base to Cape Horn is nearly 1,000 miles (1,600 kilometers). The leaf-pattern is unequal, having a broad eastern half, nearly entire at its margin, and a narrow western half, jagged and torn up into bits; and the midrib, represented by the Cordillera, is itself double or triple in its northward division, and is frequently cut across by rents, which continue outwards to the margins as long, very meandering rivers. The southern part, or leaf-point, is prolonged, and bent towards the east, and greatly frayed and divided, longitudinally and transversely, as if breaking to fragments. To drop the comparison with a leaf, we may merely indicate the geological bearings of its structure, as being what remains of a larger mainland which has been partly submerged, like what Scotland and Scandinavia should be if certain changes which have befallen them had been more intense. Viewed in this way, the islands and submarine banks that remain southwards, as the South Shetland Isles, may be regarded as the surviving rudiments of a drowned continent. These facts cannot here be dwelt on, but must be kept in memory when considering questions of distribution. In Vol. IV of this series of Reports Professor Ortman discusses the theory of Antarctica, or of former land-connections in tertiary times, across the South-polar regions between Fuegia and Tasmania, possibly extending to South Australia, and approaching, though perhaps not actually reaching New Zealand. Our knowledge of the southward islands has been recently enlarged by the antarctic exploring expeditions. The most interesting discovery has been of fossil pteridophytes and conifers of palæozoic age in the South Shetlands.

The correlative exposures of the land east and west of the Andean range, which is determining the political relations, as between Argentina and Chili, seem largely to have determined the botany, and first of all the climatic differences. And as the good climate, excessively moist, and very rich for its vegetation, lies away from the foci of modern civilization, and the eastern plains, very dry, and rocky, and treeless, are uninvit-

ing, the country is still unimproved as compared with other sections of Neogæa. If the mountain range and the moisture had been on the eastern side perhaps the present conditions should have been better. And men may nevertheless discover, as they are already realizing, that round by the western shore good lands remain, inviting colonization and agricultural development.

It must be conceded that in its present condition the vast eastern plain is not attractive. The special adaptations to a xerophil life are not things of beauty. Dense, woolly hair, secretions of resin and wax, reduction in size of leaves, involution of leaf-margins, closely apposed leaf-surfaces, pulvinate habit, the ramifications being very intricate and packed together into moss-like masses which you can hardly cut with a knife; thick epidermis, often backed beneath by thick hypodermis, and often strengthened by scleroderm as buttresses; deeply immersed stomata; in grasses convolute leaves and development of nodal cushions, and the brownish or lurid shading of leaves and flowers characterize that vegetation. The steppes are a low plateau, devoid of trees, but with herbs, shrubs and thorny bushes, the herbs being largely gramineous, and synantherous (of Calyceraceæ and Compositæ). In winter the bare interspaces between the shrubs become filled, after rain, by *Alfilerillo* (Erodium) which is valuable for sheep, and may yet become a leading factor for civilization. In the alluvial ground, and low parts, wheat and grape vines, and apple trees, when introduced flourish very well. The marine algæ, and the fisheries, give promise of future productiveness.

Some of the rivers which flow into the Pacific Ocean have their sources in the tertiary plateau which extends east of the main Cordilleras, and penetrate the mountain axis, cutting their way westward, a feature which is very frequent along the whole Andean Chain. In Patagonia a long line of cliffs borders the Atlantic coast, being interrupted at intervals, where broad valleys open into the sea, and carry rivers from more elevated parts and the mountain lakes. This general plain rises towards the Cordilleras, with depressions which contain the straggling streams and the salinas, or saltish lakes; whilst occasionally, especially in the southern parts, immense sheets of basaltic lava cover the surface. "The aspect rapidly changes along the approaches of the Cordillera. It is a broken region, often mountainous, rich in prairies, rich above all in sheets of water, the smallest of which equals the area of the great European lakes;

a privileged country, where the climate is free from extremes, where the moisture is sufficient, where forests, easily penetrated, adorn the mountain sides" (Gallois, *Les Andes de Patagonie*).

The striking phenomenon of the existence of plants of the same or of closely allied species in unconnected localities, attracted the attention of the older botanists and became a subject of speculation. The doctrine of Schouw, reinforced by Louis Agassiz, that these cases were to be explained by the creation of the original members of a species in duplicate, or in multiple, was promptly opposed by Joseph D. Hooker, whose researches into the Antarctic flora made it clear that there must be means of distribution whereby the plants of some of the regions could reach other regions. He argued (*Flora of New Zealand*, 1853), that the individuals of every species have been distributed from one center, and that species must have originated in particular centers, whence they were spread, as opportunities occurred; also that their scattering was by natural causes, but not necessarily in all cases by the same causes to which they are now exposed. Asa Gray subsequently endorsed and illustrated these views (*Flora of Japan*, 1859, reprinted in Gray's *Scientific Papers*, II, 126 sqq.) insisting on the local origin of species, and on their migrations from one place to another, often under the pressure of climatal changes. The writings of Charles Darwin and Alfred Russell Wallace, substantially settled this controversy, by showing that in order to explain the present distribution we must consider the opportunities or difficulties of access of plants from other regions. Thus Darwin, and afterwards Ball, observed that the absence of trees in the Patagonian plains was due to the land having been recently submerged, and that there was no neighbouring country from which after emergence it could be stocked with suitable trees.

These considerations taken along with the xerophytic climate of the eastern plains led us to expect a very poor flora. But on including the western slope, and the islands on the west and south, the number of species of flowering plants in the Patagonian-Fuegian Region turns out to be about 2,100, with about 350 good varieties in addition. This is the same total as that made out for Victoria in Baron Mueller's analytic summary, and we regard it as a favorable showing for Patagonia. The number of genera is 522, belonging to 113 families. Of these the Gymnosperms have 12 species in 7 genera. The Monocotyledones have 481 species and 85 varieties; 106 genera, and 17 families. Gramineæ alone number so

many as 276 species and 50 varieties. The Dicotyledones have about 1,600 species, and 240 varieties, in 410 genera, and 92 families.

An examination of the affinities of species and of their geographical distribution leads to the conclusion that the Patagonian lands constitute a true botanical region, well characterized yet not sharply limited by natural boundaries. Thus we find the native species settling into diverse groups, each presenting its own distributional problem, and bearing testimony which has not yet been fully interpreted.

1. We have a large number, about 120 species, of plants which are somewhat isolated, and characteristic of the region. A number of these have become famous, and many more are deserving of attention. Some of the remarkable genera are almost confined to the region, and of the other genera several species are confined to it.

2. On the other hand we note about 150 genera of plants characteristic of Temperate and Warm-temperate climates elsewhere, and most of them widespread, yet not known in Patagonia. Some of these are here represented by allied, often peculiar, forms. These facts taken together favor a theory of long-continued geographical demarcation, or partial isolation, between this and other lands of similar latitudes.

3. We also observe a large number of examples of the discontinuous distribution of identical or closely allied species; several of them remarkable; but most surprising is their large number. By the help of Engler and Prantl's *Pflanzenfamilien* we have noted as many as 106 instances of these (including a few cases of plants recently introduced). A well-known case of this discontinuity is allied species of Araucaria found here and on Norfolk Id.: others are the beautiful *Veronica elliptica* in Fuegia, West Falkland and New Zealand; allied species of *Gaimardia, Rostkovia, Laurelia*, the *Uncinia sinclairii, Ourisia* species, *Gunnera*, and *Carex darwinii* var. *urolepis* (see page 961), unite Patagonia with New Zealand; whilst some others inhabit Tasmania, and some (as species of *Pernettya*) are also in South Australia. Again some peculiar sections of large genera, as of *Myosotis* and of *Plantago*, and *Fagus*, link together the widely separated southern lands. *Kœnigia* (*Macounastrum*) has one species found both in Arctic islands, and in Himalaya, and another species in Fuegia. *Bryodes* has a species in Mauritius, and another in Magellan. *Eriogonum*, so characteristic of the Western United States, is represented by a species in Patagonia, and the common European *Geum urbanum*

seems to be at home in South Patagonia and Fuegia. The European *Ulex* (*furze*) has been introduced, but it has a native congener in *U. nanus*. *Abrotanella* unites, by closely allied species, New Zealand, Auckland and Campbell's islands, South Australia and Magellan-Fuegia; and *Artemisia*, a northern genus, has an outlying species in Chili-Fuegia. Several northern forms are represented in the Patagonian region, yet remarkable for their absence from Australasia.

4. Instances of northward, or meridional, continuity are most numerous and dominant; not largely with Argentina, but chiefly with the Andine region. Owing to the trend of the country and to the rivers flowing eastwards to the Atlantic, there is a continual system of clearing out and replenishing of plants. Floods exterminate the plants along the streams, carrying them to the ocean; and the vacated localities are soon populated by new immigrants from the mountains. This system renders Patagonia in large measure a botanical dependency on Chili; and also a landing place for immigrants from the far north, even from Mexico, California, Alaska, and by the Bering route from Asia; apparently receiving from, rather than contributing towards, the northern Floras. We find in our list about 140 genera of flowering plants which have thus immigrated southwards. It is about Magellan and Fuegia that there is least of this change seen; hence with these parts there is most permanency and most characteristic peculiarity of forms.

5. The eastward or latitudinal continuity is very limited, by reason of the broad ocean; and yet it is not inconsiderable. Patagonia, the Falkland Ids., Kerguelen, Australia, Tasmania, New Zealand, and the smaller sporadic islands of the south, are correlated both botanically and zoölogically. It is a difficult question to find the conditions, and the lines of movement of the colonization of each; but that there has been an interchange by land or winds or sea cannot be questioned. We find about fifty genera represented in this transverse colonization. In some cases the movement has been probably circuitous; from an Asiatic center forms migrated in opposite directions, some northward, and by trans-arctic land or ice bridges to America, whence by the meridian route of the Western Hemisphere they reached their goal in Patagonia; whilst others went from their Asiatic source southwards by an Oriental meridian-line to Eastern Australia, and so on. But a number of the forms that are common to Chili-Patagonia on one side, and to Australia-New Zealand on

the other side, are not of the Asiatic or Northern facies; and seem to be essentially and primitively Austral; such are some of the *Coniferæ*, the Chilian-Australian beeches (*Nothofagus*), peculiar *Liliaceæ*, *Centrolepidaceæ*, *Proteaceæ* (of this family, however, the Patagonian forms make a special section, reminding one of the case of the Marsupials); *Calandrinia*, *Colobanthus*, *Weinmannia* (its woolly seeds are supposed to indicate aëronautic propensities), *Discaria*, *Plagianthus*, *Drapetes*, *Nertera*, *Plantaginella*, *Vittadinia*, *Chiliotrichium*, and species of the *Mutisieæ*.

One difficulty as to these is to explain how they could reach Patagonia from Australasian sources; the winds and waves could "run the easting down" as seamen say, so as to carry Patagonian forms eastwards; "sed revocare gradum" is still an open problem. Whether the fragments of a lost continent in the Antarctic banks and islets are to be a leading factor in explicating this problem we cannot presently say. It is, of course, for many reasons probable, that the migration of some of the special forms of plants as well as of the diprotodont marsupial animals must have been westward toward America from their place of origin somewhere in Australasia; the share of New Zealand in helping migration may be considerable and all the more because the scattered Polynesian islands of lower latitudes seem to have little in common with Patagonian vegetation. Ever since Commerson's time the Magellan coast and the Falklands have been recognized as a sort of dumping ground for odds and ends of vegetation from all parts, much of it imported in straw and barrels from northern sources. Yet even prior to the advent of man it seems to have been subject to much accession of an extraordinary kind from other quarters; and the facts are there still ready to tell their history if we can only read them aright. The most important of these facts seem to belong to the geological history and palæontology of the Southern Hemisphere. In numerous cases, as was shown by J. D. Hooker before the British Association in 1866, the colonization was probably eastwards, from Fuegia to Kerguelen and directly to Australia. The large majority of Kerguelen Phanerogams were stated by him to have been immigrants from Southern America.

A slight acquaintance with the vegetation of the region suffices to show that it is derived mainly from the Chilian Flora, and in a less degree from that of Argentina, and that it also has very interesting though vastly fewer relations with the insular vegetation of the southern hemisphere, as

Kerguelen, Australasia, New Zealand and southern Africa. It is mainly through the Andine connection that it is remotely but very decidedly related to the Vegetation of Western North America and of Siberia and Central Asia.

The transverse course of the Patagonian river-valleys from the Cordilleras to the Atlantic Ocean; taken along with the fact that the xerophil climate and shingly plains practically confine the vegetation to these river-valleys, renders the flora of the northern and central parts of the region almost absolutely dependent on the constant replenishing from the Andine chain and elevated valleys. When the occupants of the transverse valleys become extinct, either being buried under the mountain débris in consequence of floods, or being carried out to sea, they are dependent on the arrival of a new stock of similar or diverse species to fill the vacancy.

Professor Neger summarizes the relations by stating that the Andine shingle-flora sends down many species to the Patagonian steppes, and in the valleys protected from the winds Central Chilian forms determine the character of the vegetation. Thus the Patagonian flora stands to the Central Chilian Flora in closer relations than one would expect, considering the intervening mountain chain. This chain causes great difference between the Chilian and the Argentine Flora; and yet Patagonia remains in close touch with the Chilian.

In illustration of this, Neger estimates that Southern Patagonia has 57 per cent. of its Dicotyledones in common with Chili; only 28 per cent. endemic, and even these allied to Chilian forms; whilst only 15 per cent. are of North Argentine or Brazilian affinity. He also remarks that the comparison of genera is more significant, of which 88 per cent. are Chilian; a few genera endemic, and less than 9 per cent. unknown in Chili, but found in Argentina or Brazil. We think that these percentages would still be near the truth although the figures in the present list are at least twice the number known to Neger.

Neger adds that Geology will aid in explaining why the colonizing was not chiefly from Argentina, though no high mountain barrier intervenes in that direction. This depends on the fact that Patagonia was recently under the sea, and after emerging, its river valleys running from west to east carried the immigrant plants across from the Chilian Andes. He notes that the flourishing European apple-trees of Patagonia prove that

many other plants would thrive there, if only they could find an entrance. This consideration also helps to account for the absence of trees, inasmuch as after the extinction of large Patagonian glaciers, from none of the adjoining lands have trees been able to invade the vacant territory. The chain of the Andes from which alone they could come has few large trees southwards, and none suitable for the soil and climate of the plains or the intersecting valleys. That trees have no objection to Western Patagonia, or to the Magellan and West Fuegian districts is evident from Professor Dusén's summary. It is within the possibilities that the Patagonian region may yet be improved by the judicious introduction of trees and shrubs.

In extending our view further northwards we are struck by the fact that the famous papers by Asa Gray and Joseph D. Hooker on the Origin of the North American Flora, admit of extension in two directions, both as to the *terminus a quo* and to the *terminus ad quem*. Instead of starting from the Arctic regions or from Scandinavia our present knowledge of plant-distribution points very strongly and directly to Central Asia as the home or distributing center of the plants of all the temperate and colder parts of the world. The Arctic regions are rather remarkable for the absence of endemic species, but have formed a convenient bridge for the passage to and fro of forms belonging to the less rigorous parts of both hemispheres. Their Old World connection is shown by the examination of the *Index Kewensis* to be chiefly with the northern and central parts of Asia. The Himalaya region is unique for the diversity of its climate at its different elevations; and sends colonies of its plants westward, by Asia Minor to the Mediterranean region, and as far as the Canary Ids.; southwestward to Arabia and Africa; across the Orient to Australia; eastward to China and Japan; and northwestward to Europe.[1] The course of distribution of animals has been similar; the Elephants migrated from the foot of the Himalayas to western Europe as far as Great Britain, and even to the cold parts of northern Asia, and over into Alaska, whence they spread over parts of America, reaching as far as Patagonia. The distribution of the Mosquitoes exhibits the same tendency.[2] And in a recent paper in *Nature* upon

[1] See A. F. W. Schimper (*Pflanzengeographie*, 786 sqq.) on the diversity of climate and richness of vegetation of the Himalayan Region.

[2] Monograph of Culicidæ, F. V. Theobald, British Museum, 1901. Observe especially the distribution of *Culex nigripes*, the Scourge of Alaska, from Kashmir.

the butterflies on the borderland of North and South America, a writer with the familiar initials E. B. P. supplies us with very pregnant suggestions in the same directions.[1] It is there shown that the U-like shape of the borderland about the Gulf of Mexico and the Caribbean Sea has had a special influence on distribution. Not only have many southern forms come northwards; but in turn northern forms have migrated southwards; oscillations of the backbone of the New World, accompanied by changes of climate also serve as determinants of the direction and result of the migrations from colder climates. Gray and Hooker gave special emphasis to the return northward of plants that had previously moved southward; but it would appear that some individuals had in Glacial times gone so far south as to leave themselves no room for repentance on the return of warmer times. They went further south, hugging the Andes, and finally a selection of them reached Patagonia.[2]

It is to be remembered that in such cases the immigrants frequently change by way of adaptation to the new homes; their resemblance to the old ancestral forms will be generic rather than specific. Such a form as *Braya* presents a series of specific forms, reaching from the Alps of Europe by the Caucasian range, with a couple of species in the Himalaya region; so on through Siberia and across Bering Strait to Alaska and the mountains of Western America, down to southern Chili and Patagonia; reappearing again in New Zealand; almost belting the world.

We have been anticipated to some extent on this subject by Professor N. L. Britton, who addressed a meeting of botanists at Buffalo on the influence of the mountains of Asia in plant-distribution. Mrs. Britton informs us that a large number of our American Mosses occur as well in Cashmere Valley.[3] Wallace had something of the kind in view when in his work on *Island Life* he referred to the mountains of the Oriental islands as receiving contributions carried by the winds from the Himalayas. Asa Gray in his paper on the Flora of Japan (*Scientific Papers*, ii, p. 125), finds many species common to Japan, the Himalayan region,

[1] *Nature*, Nov. 13, 1902. (Presumably E. B. Poulton.)

[2] See Schimper (Père), *Paleontologie Vegetale* on the Glacial and Post-glacial Flora of Europe.

[3] Mrs. Britton refers to a statement by V. F. Brotherus in the Contribution on the Bryological Flora of the northwestern Himalaya, Helsingfors, 1898. The list includes 49 genera and 96 species, all mosses which are also found in North America; the altitudes vary from 6,000 feet in the valleys to from 20,000–26,000 feet on the highest mountains, and the flora is similar to that of the mountains of Europe and temperate North America.

and Eastern North America, and that characteristic North American genera have one or more closely representative species in the Himalayan region; and he quotes an unpublished opinion of Bentham, as the natural conclusion from all these data, that the interchange between the temperate floras even of the western part of the Old World and the New World took place mainly via Asia. Mr. Bentham also refers (*Journ. Linn. Soc.*, ii, p. 34), to how frequently large American genera are represented in Eastern Asia by a small number of species, which gradually diminish or disappear westwards towards the Atlantic limits of Europe. There are few distinctively European forms in the eastern part of America, thus testifying that the European region was not directly in the line of passage between the Old and New Worlds.

The distribution of animals reinforces this doctrine: Dr. C. W. Andrews has proved that the proboscidians have originated in Africa, and the presence of remains of more than a score of species of elephants and allied forms near the Himalayas points out the probable route by which they travelled from Africa to Northeastern Asia and to America. Whilst it is as a center of distribution rather than of origin, that we are speaking, probably every region which is favored with suitable climate and soil is in some degree a center of origin. Mountain chains have characteristic advantages and limitations in both ways. How much have the Andes of America and the Blue Mountains of Australia done for distribution at least in the countries beyond them, as high roads for species which could not have travelled by valleys or plains! Sheltering from excessive heat and from drought, and intercepting winds which convey seeds from afar, they afford friendly resting-places, with variety of soil and exposure so as to suit every comer; and improving the stock, by new variations, they send them out again by various channels into the general circulation. This has been the function of the American chain, as Patagonian plants abundantly testify; and the evidence points to it unmistakably as the function of the great tablelands and complex mountain system which surround the "roof of the world" in central Asia.

Most significant in this respect are those species and genera which are in large measure peculiar to and characteristic of the Region of Patagonia and Southern Chili, and which secure to the area the rank of a proper botanical region. Some of those are related to forms existing in Brazil and Texas; some allied to Australian or even South African forms;

but they have their own facies; and the presence of any of them at once identifies the source of a collection. Of these the most noteworthy are the species of *Ephedra*, *Chusquea* (Gramineæ), the Tussock-grass, and *Carex patagonica*, and species of *Uncinia*, *Philesia* and *Lapageria* (shrubs both of Liliaceæ), *Chloræa* (Orchidaceæ), *Myzodendron*, *Iodina* and *Arjona* (both of Santalaceæ), *Hamadryas* (Ranunculaceæ), *Drimys* (the celebrated Winter's-green, of Magnoliaceæ), *Anarthrophyllum* and *Patagonium* (both of Leguminosæ, the *Patagonium* having many species), *Acæna* (Rosaceæ, many species), *Azorella* (Umbelliferæ, many species), *Schinus* (Anacardiaceæ, the Incense-bush), *Pernettya* (Ericaceæ), some peculiar species of *Verbena*, and of *Berberis*, *Benthamiella* (Solanaceæ), *Boopis* and *Acicarpha* (both of Calyceraceæ), *Lepidophyllum*, *Nardophyllum*, and many other forms of fruticose Compositæ; many species of *Nassauvia* and also of *Perezia*, representing the Mutisieæ, a tribe of Compositæ. This is a long list of very peculiar and interesting species or genera; most of which seem to be in or near their primeval homes, and are like the survivors of the inhabitants of a more extensive land.

The general outcome of the data favors the theory of an incomplete continuity of the southern lands in former times, so as to secure opportunities of transit, and also a measure of relative isolation. The landward side secures some isolation at one part by difference of climate and by impassable plains; at another by the mountain chain which makes simultaneously a highway and a barrier. The geological data, as given elsewhere in these reports, indicate the curious and significant structure of the southern mountains, dividing into parallel ridges, and cross-hatched by deep valleys, and rivers, and gradually sinking southward as well as spreading out like a fan, until they are ultimately lost in the deep ocean, here and there a "rudiment" of former land emerging to betray their secret. A recent writer in *Nature* summarizes Sir Martin Conway's description of Tierra del Fuego, showing how the deeper hollows between the cordilleras have been invaded by the sea, so that there is a long trough parallel to the coast-line, and many a transverse channel. And he specially notes the rapid change of sea-level now going on. In Darwin's time the glaciers of Mount Sarmiento reached the sea; now they are separated from the sea by woody belts; and raised beaches and boulders give evidence of frequent oscillating of sea-level.

Southwards of this system of long fiords and cross-channels, the land

is completely sunk at Cape Horn. But that seems not to be the end of the American continent. Differences of sea-soundings, and the South Shetland Isles, suggest its extension onwards towards the south pole; and finally the transpolar lands with their volcanoes, Erebus and Terror, are still claiming an Andean ancestry.

The above was in type when we saw Mr. F. W. Hutton's letter on Ancient Antarctica (*Nature*, July 13, 1905). The recent distribution of both animals and plants proves to him the former existence of an antarctic continent connecting South America with New Zealand and with South Africa in the Jurassic period. This sank in the Cretaceous period; and he believes that there has never since been a land connection between Antarctica and the other continents; but in Cretaceous and earlier times a Pacific continent connected New Guinea and New Zealand with Chili; and in Pliocene times a number of islands existed in the Antarctic Ocean, which have since disappeared. Both flora and fauna were formerly richer in that region than now; and a connection is shown between Australia and South America by animal forms like *Osteoglossum* and *Ceratodus*, also by Marsupials and South American frogs, none of which have reached New Zealand. The Antarctic islands have a number of birds, fishes and plants in common which could hardly have spread round the world under present conditions of land and water. That this spreading was comparatively late, is proved to him by near relations between the species. He argues that if there had been continuous land at the time the land animals should have spread along with the marine forms. Most land-plants on the other hand do not require absolute continuity of land to enable them to spread. It may be proper here to refer to Engler's view, cited above (p. 336), "where seeds are carried by birds and over oceans several genera have representatives both in Australia and South America"; and he adds that the facts point to a former tropical, subpolar vegetation.

Such indications seem to us to speak of a broken chain rather than a continuum of land; of an archipelago on a great scale, some of its components of the continental kind as to dimensions; and with interruptions which secured animal and vegetable isolation; yet sufficient to permit occasional passage of seeds and of birds, and an occasional transit of a quadruped, a sort of quasi-fuegian archipelago on a larger scale. The fact that the affinity of both Australia and New Zealand with South America is meagre as to its animals, and not at all general as to plants,

favors the supposition that if ever a connection existed, it must have been of the nature of stepping-stones rather than of a bridge. There are also indications of some passage between South Africa and South America, but as to the nature and limitations of this we are ignorant. In some instances at least the connection seems to have been via the highlands of Eastern Africa, and the circuitous route by the Asiatic highlands and Bering Strait.

As a general rule, the plants appear to us to be a match for the animals in their power to survive adverse conditions, probably through their ability to revive after long periods of dormancy. They can passively extend their spheres, and on reaching new localities they may or may not experience a conversion into new varieties or species. If the Ice-age drove temperate plants southwards in North America, we may conclude that a return of milder seasons would not send them all back again towards the poles; but some would be allured by mountain ranges, rich in moisture and with cool air, to push their way farther south, ultimately reaching Southern Chili, and a few of them even leaving vestiges on the mountains of Central America or Peru. Thus the very same species sometimes occurs in Alaska and at Magellan Straits, as if the northern plants had made raids southwards, probably on more than one occasion, and had never failed to leave some of their party behind as permanent settlers.

SUPPLEMENTARY REVISIONS AND CORRECTIONS.

(Kük. represents *Kükenthal;* IK–s1 and IK–s2, the first and second supplements of the *Index Kewensis.* The accepted names in this list are italicised.)

Page 203. *Deschampsia* tenella, Philippi (1899; nomen mutandum, because of D. tenella, Petrie, 1890, a New Zealand grass). We may call it *D. philippii* (Phil.).

Page 204. *Trisetum* antarcticum Trin. is *Avena subspicata* (Beauv. sub Trisetum).

Page 234. *Festuca* bromoides Lin. becomes *Vulpia bromoides* (Linn.), fide IK–s2. *Vulpia* Gmelin, as a genus, differs from *Festuca* by having secund narrow and dense panicles, and the empty glumes very unequal.

Page 278. *Carex atropicta* Steud. (1855) is identical with C. lechleri (Phil. 1857); and has priority.

Page 278. *Carex banksii* Boott and (page 288), C. trifida franchetii Kurtz are identical with C. germana Boott (fide Kük.). *C. banksii* Boott must be the name as it comes earlier than C. germana in *Flora Antarct.*, page 365. It is also figured in plate cxlii of that work.

Page 280. *Carex decidua* Boott (1845) includes the later C. pedicellata Phil.

Page 281. *Carex filiformis* L. subsp. *æmatorhyncha* Desv. (in Gay's Fl. Ch.) is C. campyloxys Steud. (1855).

Page 282. *Carex gayana* Desv. (in Gay's Fl. Ch.) includes C. schedonautos Steud.

Page 285. *Carex* pedicellata Phil. is a synonym of *C. decidua* Boott (1845).

Page 285. *Carex* propinqua N. & M. is a synonym of *C. leporina* Linn.

Page 288. *Carex urolepis* Franch. is a variety of *C. darwinii* Boott. This form, once found only in Patagonia, is now discovered in New Zealand. (L. Cockayne.)

Page 306. *Tristagma* nivalis Poepp. should be *Brodiæa nivalis* (Poepp.), fide IK–s2.

Page 318. *Symphyostemon* biflorus Dus. is *S. odoratissimus* (Lindl.) Miers, fide IK–s2.

Page 345. *Prosopanche burmeisteri* DeBary (1868) includes P. americana O. Ktze.; fide IK–s2.

Page 362. *Monolepis* chenopodioides Moq. (1849), and M. trifida Schrad. (1830) are synonyms of *M. nuttalliana* (R. & S. sub *Blitum*, 1822. IK–s1 awards the priority to *M. trifida*).

Page 382. *Monocosmia monandra* R. & P. (circ. 1794), includes M. corrigioloides Fenzl. (1839); fide IK–s1.

Page 461. *Hydrangea scandens* Poepp. includes H. (Cornidia) integerrima (H &. A., and of Engl. & Prantl), Fide IK–s1. Add to its characters: *Leaves* ovate, coriaceous, entire, petiolate. *Flowers* terminally crowded in a much branching panicle, very few of them radiant.

Page 504. *Astragalus* brevicaulis Dusén (non Nelson, 1899); nomen mutandum. We may make it *A. dusenii* (Dus.); which also supersedes A. cruckshanksii Gris., 1879, because of A. (Phaca) cruckshanksii H. & A., 1833.

Page 505, no. 6. *Astragalus* (*Phaca*) *cruckshanksii* (H. & A.) is assigned by O. Kuntze to *Tragacantha* (p. 508), with its Patagonian var. *glabrescens*.

Page 505, no. 8. A. domeykianus (Phil.) is a synonym of *A.* (*Phaca*) *procumbens* (H. & A.), and is assigned by O. Kuntze to *Tragacantha*. It also has a var. *glabrescens* (p. 508).

Pages 587, 588. The name *Loasa patagonica* Speg. must have priority, having been given to a described species in 1897. Urban and Gilg's *L.* patagonica was described by them in 1900, though the name appears (nudum nomen) in Pflanzen-familien of 1894, and is quoted in IK–s1 (errore) as a good species of that date. As the other name of this species (L. pinnatifida Speg.) is preoccupied we may term it *L. karraikensis* (Urb. & Gilg.) Macl.; and the key in p. 586 should be amended accordingly.

Page 590. *Cajophora* patagonica (Speg.) U. & G. is identical with *Loasa patagonica* Speg.

Page 596. *Pterocactus kuntzii* Schurm. (Distinguish *P. kurtzii* Schurm., not in Patagon.; both are in Argentina.)

Page 597. *Daphne pillo-pillo* (Meisn.) is identical with Ovidia pillo-pillo Meisn. of DC. Prodr. Engler & Prantl refer it to *Daphne*.

Page 604. *Eugenia apiculata* DC. (non Nied., a Brazilian plant, in Eng. & Prantl, cujus nomen mutandum).

Page 605. Blepharocalyx cruckshanksii (Berg.) Ndz. is *Eugenia cruckshanksii* H. & A.; fide IK–s1.

Page 657. *Pouteria* splendens (DC. sub Lucuma), is *P. valparadisæa* Mol., fide IK–s2. Its fruit is rounded or oval, usually bitter. Occurs in Chili and Patagonia.

Page 669. Collomia linearis Nutt. (1818), is made by IK–s2 a synonym of *C. coccinea* Lehm. (probably nearly synchronous).

Page 671. *Gilia nudicaulis* Gray, 1870 (non G. nudicaulis Phil., 1895, cujus nomen mutandum; a Chilian plant).

Page 729. *Asteranthera* ovata Hansk. is identical with *A. chiloensis* Hansk; chiloensis has priority.

Page 781. *Gutierrezia* (Brachyris) *spathulata* Phil. (1865) includes G. gilliesii Gris. (1874) fide O. Ktze.

Page 784. *Nardophyllum nardophyllum* (O. Ktze., sub Aster). Kuntze's species appears to us to agree with *N. humile* in habit, habitat, in characters of head and involucre and pappus; also in having subconical compressed achenes, and therefore to be generically inseparable.

ERRATA.

(Besides the lists at the end of Parts I and III.)

Page 127. Insert head-title, PART IV.
Page 179, line 8. Read *Cabo* vice *Cobo.*
Page 269, line 10. Read *bracteosa* vice *bracteoa.*
Page 305, no. 4, title. Read *patagonica* vice *patagonia.*
Page 315, line 13. The name is *O. A. Peterson.*
Page 375. Running headline. Read *Amarantaceæ* vice *Nyctaginaceæ.*
Page 377, no. 2, title. Read *tricycla* vice *tricycle.*
Page 413, no. 2, title. The name is *Hamadryas delfini* Phil.
Page 592, no. 4, title. Read *C. patagonicus* vice *C. patagonica.*
Page 603, no. 2, title. Read *Barn.* vice *Bern.*
Page 730. After Proboscidia, read *Schmid.* vice *Scmid.*
Page 781, no. 8, title. Read *spathulata* vice *spatulata.*
Page 789, running head-line. Read *Compositæ* vice *Comsositæ.*
Page 805, line 8 from foot. Read *Candolle* vice *Condolle.*
Page 878, no. 5, title. Read Plate XXVIII *B* vice *A.*
Page 881, no. 19, title. Read Plate XXVIII *A* vice *B.*

The Explanation of Plate IV should have 41 and 43, respectively, as the page-references; of Plate XI should have *Meesea* vice *Meesia;* and the terminal "Gag." should be deleted from the title of Plate XXVI.

Plate XXVIII, title. Read *Nassauvia* vice *Nassanvia,* and *bryoides* vice *Cryoides.*

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ORDERS, FAMILIES AND GENERA.

The figures indicate the pages, frequently including more than one page. A dash (–) prefixed to the figure marks a synonym, or a casual reference.

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EXPLANATION OF PLATE XXVIII.

PAGE.

A. NASSAUVIA NORDENSKJOLDII O. Hoffmann 881
B. N. BRYOIDES O. Hoffmann 878

a, andrecium.
b, branch with terminal capitulum (in *B*), with terminal glomerulus (in *A*); also exhibiting the peculiar leaf-growth.
c, capitulum, with involucre.
co (in *A*), corolla, expanded to show its bilabiate form.
f, flowers, from different sides; one in *B* from inside showing stamens.
g, gynecium, with style, and (in *B*) its silky indument.
h, general habit.
i, involucral scales and bracts.
l, leaves.
lb (in *B*), terminal leaf-rosette.
p, paleæ of pappus.
st, style-branches.

h, *h*, are of natural size, the other figures modified.

(Note, the title of the plate has misprints in the words NASSAUVIA and BRYOIDES.)

F.v.Iterson del. J.N.Fitch lith West, Newman chr

A. NASSANVIA NORDENSKJOLDII *O. Hoffm.*
B. N. CRYOIDES *O. Hoffm.*

EXPLANATION OF PLATE XXIX.

PAGE.

PEREZIA RECURVATA (Vahl) Less. 896

an, *an*, andrecium, the lower figure showing its insertion in the tube of the bilabiate corolla.

b, leaf-bud.

ce, corolla of disk-flower, with essential organs.

df, *df*, disk-flower, the lower with the enclosing pappus, the upper passé, with pappus expanded.

gy, gynecium.

h, *h*, general habit of plant.

i, involucral scales.

l, *l*, leaves; *la*, leaf-apex; *ls*, leaf-section.

p, pappus; *ps*, one of its setæ; *st*, style-branches.

h, *h*, are of natural size; the other figures magnified.

F v Iterson del J.N Fitch lith

West, Newman chr.

PEREZIA RECURVATA *(Vahl.) Less.*

EXPLANATION OF PLATE XXX.

(Prepared in Berlin through the courtesy of Dr. O. Hoffmann.)

NEW COMPOÆ

PAGE

A. SENECIO HATCHERIANUS O. Hoffm. 847

B. SENECIO DUSENII O. Hoffm. 844

C, D. NASSAUVIA DUSENII O. Hoffm. 879

E. TRIPTILION DUSENII O. Hoffm. 885

All of natural size, and showing the general habit.

Werner & Visher, Washington D.C.

NEW COMPOSITAE

EXPLANATION OF PLATE XXXI.

PAGE

BACCHARIS URVILLEANA Brongn. 810

This plate, of an undescribed species, is a replica of Plate 61 in Brongniart's *Voyage de la Coquille* (1828–29). Prepared for us through the courtesy of Professor Lloyd and of the New York Botanical Garden.

A. Branch of fertile plant, showing the opposite leaves, and the corymbed heads of pistillate flowers.

B. Branchlet of the sterile plant, with its heads of hermaphrodite, non-fertile flowers.

Figs. 1, 2. Fertile capitulum, and a flower of the same; the latter showing the probably 5-costate achenium.

3. Style-branches of the fertile flower.

4. Tip of one of the bristles of the pappus, much magnified.

4, 6, 7. A sterile (hermaphrodite) capitulum, also one of its rudimental ovaries, and one of its flowers, with the protruding stamens.

8. Two of the anthers, showing their apical appendage, and their basal rounded lobes.

Figs. 1 and 5 also show the imbricating, subequal, involucral scales.

Voy. de la Coquille.

Pl. 61.

Baccharis Urvilleana.

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